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**The impact of financial analyst coverage on stock properties:
the experience of the Malaysian research incentive scheme**

Azian Madun

A thesis submitted for the degree of Doctor of Philosophy

University of Bath

School of Management

August 2008

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Azian Madun

Abstract

The thesis examines the impact of the incentive scheme of financial analysts coverage in the Malaysian stock market. We provide new evidence that not all of the analysts reports and recommendations are closely followed in the market. We examine companies that are participating in the incentive scheme and compare with the control group of companies that are not involved in the incentive scheme. We have applied two different models in the event study methodology by using two different approaches, i.e the parametric and non-parametric methods.

Examining the daily movement of stock prices and other variables around the event, we find evidence that there are no significant changes on the share prices, trading activity, liquidity or the degree of information asymmetry upon the release of the analysts' initial reports. The insignificance statistical tests of our empirical results means that the analysts coverage does not improve the level of information asymmetry between investors and the managers of the companies. Therefore the financial analysts do not bring new or useful information in their reports, hence, are largely ignored by the market. Alternatively, it also means that investors ignore the analysts reports because they do not know how to read the reports although there is new information in the reports. Our study implies that in the short and medium term the incentive scheme to increase analysts coverage has not been beneficial to investors or companies and hence the incentive scheme should be scrapped unless a few changes are made.

The results of the thesis have strong influence on policy. Among others, the financial analysts should add more detail information in their reports and the authority should strongly protect investors from the insiders manipulation.

List of Abbreviations

AMEX	American Stock Exchange
ANOVA	Analysis of variance
AR	Abnormal return
CAR	cumulative abnormal return
HSD	honest significant difference
IPO	Initial Public Offering
KLCI	Composite Index of the Kuala Lumpur Stock Exchange
KLSE	Kuala Lumpur Stock Exchange
LSD	unrestricted least significant difference
NASDAQ	National Association of Securities Dealers Automated Quotation System
NYSE	New York Stock Exchange
OLS	ordinary least square
RM	Ringgit Malaysia
SEC	Securities and Exchange Commission
U.K.	United Kingdom
U.S.	United States of America
WSJ	Wall Streets Journal

Chapter 1

Introduction

1.1 Background

In the financial market, investors are always advised to acquire sufficient information and be informed before they make any investment decision. As there are a variety of sources of information, the amount of information could be huge and therefore the reliability of the information could be questionable that investors need the professionals services to interpret and provide them with relevant and accurate information. This is when the services of the professionals, or the so-called financial analysts, are needed. Financial analysts serve investors by providing investors with information they need to help them make an informed decision through analysts reports or brokerage newsletters.

However, the almost complete failure of the highly paid financial analysts in the United States of America (U.S.) in early 2000 to predict the massive bankruptcies of the U.S.-based companies such as Enron, WorldCom, and Global Crossing has inevitably drawn public scrutiny on the efficiency of the financial analysts. Despite the failure of the professionals to detect and report those dubious corporate reporting earlier, the role of financial analysts of providing useful information to the public and private investors is still obviously essential. Investors reliance on the financial analysts' reports and their services is reasonably understood because the financial analysts must be able to develop close relationships with the management of the companies they are covering. The close relationship between the financial analysts and the company is important so that the

analysts can have better understanding about the company, hence, the analysts are assumed to know about the company better than the general public (Healy and Palepu, 2003).

1.2 The importance of information in the financial markets

Obviously, information is vital to investors in the financial markets. Investors' ability to quickly react to the arrival of new information is crucial for investors to maximise their profits in the financial markets. Investors are always advised not to solely rely on analysts' recommendation when deciding whether to buy, hold, or sell a stock. Investors are also advised to do their own research and be informed to make sure that the investments they choose match their goals and tolerance for risk (U.S. Securities and Exchange Commission, 2007a).

In equilibrium, price movements are primarily due to the arrival of new information. However, there is always interference of noise in the market that will distort and disturb the process of price adjustments to reveal its full information (Black, 1986). The presence of noise will delay prices to incorporate new information, hence, there is always an opportunity to gain profit or arbitrage while prices take time to adjust to reveal and incorporate the new information.

However, not everybody has the same resources to access information, while some people refrain from searching for information. According to Stigler (1961), the neglect of ignorance creates price dispersion, thus people with extra knowledge will have an advantage of other people's ignorance as they know better about the true value of the asset. Obviously, an informed trader will have an advantage over an uninformed trader because the uninformed trader will not know whether the asset is over or under-valued.

In the financial markets, the well-informed agents can improve their profit by signalling their private information to the uninformed agents. In other words, the well-informed investors can give false signals to the uninformed agents in order to manipulate the uninformed investors (Spence, 1973; Bommel, 2003). It means that information asymmetry

can also be purposely created and then exploited by the people who have more knowledge about the company.

Due to the exploitation and advantage of the well-informed investors, having access to information is vital for investors. One source of getting information about a company is from the financial analysts reports. A financial analyst is a person who is employed, usually by the brokerage companies, to undertake research into markets, firms and securities. Financial analysts review industry trends, assess company strategy and management strengths, and forecast the performance of the companies they track. Based on the information they gathered, financial analysts produce reports that will recommend investors of whether to buy, sell or hold certain securities.

1.3 The imbalance of financial analysts coverage

Despite the critics and recent scandals surrounding the career and reputation of financial analysts, the reports produced by the financial analyst, to a certain extent, are influential and have great consequence to many market participants (Fogarty and Rogers, 2005). However, the circulation of the financial analysts' reports is generally limited to the subscribers and important clients of the analysts only. As a result, only a few investors will have access to the information.

Due to limited resources, the companies covered by the financial analysts are also limited. It is easily observed that the types of firms covered by financial analysts are mostly big, well-known firms that are highly capitalised and actively trade on the stock exchange. News on these firms also always appear in the mass media, such as on television business news or newspaper business sections. On the other hand, small and medium size firms are rarely covered either by the financial analysts or mass media journalists, even though some of these firms are financially sound and well-managed firms. So, it is evident that there is an imbalance of media reporting between the big and small companies (Mahoney, 2000).

It is also evident that the imbalance of information is in favour of the big and well-known companies. The imbalance of information available to the public between the

big and small firms affects the companies' valuation and share prices. The impact will be more severe in emerging markets where the prevailing nature of thin trading is more rampant than in the developed markets (Aggarwal et al., 1999; Antoniou et al., 1997). As such, there is a need to increase financial analysts coverage as well as to balance the coverage of companies.

1.4 Research background

Recognising the importance of analysts' coverage, some stock exchanges in the world have already initiated some forms of assistance so that companies listed on their exchanges will receive more publicity and promotion. By having more publicity and promotion of companies listed on the stock exchange, investors will be more aware of the companies, and ultimately lead to higher trading activities in the stock exchanges. For example, the Singapore Exchange is probably among the first that started to offer an incentive scheme helping to promote companies listed on the its stock exchange by introducing a financial analysts coverage scheme starting in 2004. By participating in the scheme, the listed companies have to pay some money if they wish their companies to be covered by the analysts (Monetary Authority of Singapore, 2006).

The Malaysian stock exchange, Bursa Malaysia has also launched a similar incentive scheme of providing financial analyst coverage in early 2005. Ultimately, the purpose of the incentive scheme is to increase market liquidity especially among the small and medium companies. We will discuss further in Section 2.6 about the new incentive scheme of financial analysts coverage initiated by Bursa Malaysia to companies listed on the exchange.

Consequently, in the study we are interested in examining the impact on companies that are participating in the financial analysts coverage incentive scheme, implemented by Bursa Malaysia. If the incentive scheme brings in new information, then we will expect to observe the share prices of companies participating in the scheme to adjust accordingly. In other words, we are interested in investigating the impact of the financial analysts coverage in promoting the companies that are participating in the scheme.

1.5 Rationale of the research

There are many previous studies on the effects of a particular corporate announcements or events such as the effects of analysts recommendations (Barber and Loeffler, 1993; Womack, 1996), the effects of earnings forecast (Ivkovic and Jegadeesh, 2004; Lim and Kong, 2004), or the effects of changes in the component of stock market index (Chakrabarti et al., 2005; Denis et al., 2003). Even though many previous studies have covered similar topics regarding the effects of financial analysts, most of the studies were performed on the developed markets like the U.S. or the U.K. To our knowledge, there is no published research that examined the impact of financial analysts coverage in a developing market like the Malaysian stock market. Moreover, the study is different from the others in terms of the setting of the research.

The setting of the research is totally different from the existing industry practices worldwide. It is because the companies in the study are participating in the incentive scheme arranged by the Malaysian stock exchange. Compared with the usual practice in many financial markets in the world, the decision to report and research a firm is up to the brokerage companies or banks where the financial analysts are employed, thus the firm covered by the analyst does not have to pay anything. In other words, the analysts coverage of a company depends on the direction from the analysts' employer. With the new incentive scheme implemented on the Malaysian stock market, the listed company is paying for the service of analysts who are covering and reporting the respective company.

In the usual practise, the brokerage companies earn money from trading fees, and therefore the analysts are pressured to produce reports in favour of the company (McNichols and O'Brien, 1997). However, with the new setting arising from the implementation of the analysts coverage scheme, the analysts are receiving money for producing the reports and therefore they are facing less pressure to produce favourable reports on the company (Bailey et al., 2003).

The other unique difference in the study is that the financial analysts' reports are now immediately and freely accessible online on the Internet. Usually, it is difficult for investors to have access to company reports produced by the financial analysts. It is a common practise in the industry that investors have to pay money if they want to have

access to the analysts reports. Usually the analysts reports are free of charge to the clients of a brokerage company, otherwise, investors have to pay if they want to see the report. For example, investors in the UK have to pay £15 if they want to access the online company report on HBOS plc from Reuters Estimates (Reuters, 2006).

However, as the analysts reports on the companies participating in the scheme are freely available online, it means that the information is now freely accessible online; hence, the information search can now be easily done using the computer. Obviously, with the reports being freely accessible from the Internet, the cost of searching and acquiring for information on companies that are participating in the incentive scheme is very minimal, so investors should also expect a very minimal profit if they trade solely based on the information from the analysts reports. As suggested by Stigler (1961), the amount of search is optimum if the expected marginal return equals the cost of search for information, and therefore the return from trading on the analysts reports could be very minimal since the cost of information search is very minimal as well.

Furthermore, Shapiro (1968) suggests that the price of a product or service has a psychological impact on people. People view low pricing of a product or service as being associated with low quality, especially if it is difficult to judge the quality of the product or service. As investors can only judge the quality of the analysts reports based on future performance of the company covered or recommended by the analysts, the price of the analysts reports is the only basis to judge the quality of the reports. As the analysts reports are free of charge, people may be of the view that the reports are low in quality.

Since the analysts coverage incentive scheme in the Malaysian stock market is a new arrangement in the market, the changing of arrangement should make for an interesting market microstructure research. Like any other new arrangement, it will likely affect the price discovery and liquidity in the market (Bekaert and Harvey, 2003). The study is undertaken using data from the Malaysian stock market which is one of the emerging markets in Asia. The Malaysian equity market, just like any other emerging market, is not well-covered in terms of published research and academic journals.

Furthermore, Bekaert and Harvey (2003) report that there are not many genuine microstructure researches on emerging markets because accurate and detailed data are

difficult to obtain. They also argue that many standard finance models are not applicable in the emerging markets due to differences in their specific circumstances. By studying the Malaysia equity market, the research will contribute to better understanding in the literature of emerging markets.

Therefore, the study is vital to determine the effects of the analysts coverage incentive scheme on companies that were taking part in the scheme. In particular, we are interested in investigating the effects of the analysts coverage incentive scheme in reducing information asymmetry. Based on the background and the rationale for the research presented above, the research questions that will be investigated in this study are as follows:

Research question 1: How does the financial analysts coverage incentive scheme affect the performance and valuation of the companies participating in the scheme?

Research question 2: Does the analysts coverage incentive scheme have any informative role in reducing information asymmetry among the participating companies?

Research question 3: Do the different type of analysts recommendations have different effects among the participating companies?

Research question 4: Does the incentive scheme have any beneficial effect on the companies, the stock exchange, investors or other market participants?

1.6 Thesis structure

The thesis is organised into eight chapters. This chapter is the introduction and overview of the study which includes the research background, its rationale and the research questions.

Chapter 2 provides an overview and brief history of the Malaysian stock market. It also explains the trading system and the dissemination of announcements by the listed companies. The role and the activity of financial analysts in the Malaysian stock market are described in this chapter, as well as the incentive scheme of financial analysts coverage.

Chapter 3 provides the literature review of the impact of information asymmetry in the financial market. The proxies used to measure information asymmetry are also

explained. This chapter also reviews the Kyle's theoretical model of price formation under the presence of informed trader or information asymmetry. The extension of the Kyle's model is also covered in this review. The relation of information asymmetry and efficient market hypothesis is also explored. This chapter also examines the informational role of trading volume and a volume-return model to measure the presence of informed trading.

Chapter 4 describes the role of financial analysts as a marketing agent for the brokerage and monitoring role for investors. This chapter reviews the determinant of financial analysts coverage and presents past empirical studies related to financial analysts. It also examines the importance of initiating analysts coverage.

Chapter 5 presents the development of the research hypotheses and the methodology of analysis that will be applied. The measurements and the statistical tests of significance for the hypotheses are also presented.

Chapter 6 presents the analysis of results and statistical tests that have been performed. This chapter analyses and interprets the results.

Chapter 7 presents the discussions and implications of the results for theory, empirical and policy.

Chapter 8 concludes the study by summarizing the findings of the research, its contribution and limitations. It also offers suggestions for further research.

Chapter 2

The History And Overview Of Malaysian Stock Market

2.1 Introduction

In the earlier chapter we have provided the background, rationale and the purpose of the research. It is obvious that investors need information before they can invest. However it appears that research on the initiation of coverage of financial analysts is limited. Furthermore, it appears that there is no published academic research investigating the impact of analysts coverage in the Malaysian stock market and most previous research used data from the more developed markets. In this chapter, we provide a brief overview and history of the Malaysian stock market and changes in the market microstructure occurring in the past two decades. We briefly describe the law that governs the profession of financial analysts and brokerage industry in the Malaysian market. Finally, we describe the incentive scheme of financial analysts research initiated by the Malaysian stock market.

2.2 The history of the Malaysian stock market

In Malaysia, the Kuala Lumpur Stock Exchange (KLSE) is the only stock exchange approved by the Minister of Finance of the Malaysian government under the provisions

of the Securities Industry Act, 1983. The KLSE is a self-regulatory organization with its own memorandum and articles of association, as well as rules which govern the conduct of its members in securities dealings. The KLSE is also responsible for the surveillance of the marketplace and for the enforcement of its listing requirements, disclosure requirements and standards to be maintained by listed companies.

Although the history of the KLSE can be traced back to the 1930s, the KLSE was officially registered as a company in 1973. The re-organisation of the KLSE saw the changes from a company limited by guarantee to a company limited by shares in January 2004. The KLSE officially launched its new name, Bursa Malaysia, and eventually became a public limited company listed on its own exchange in March 2005.

Initially, there was only one trading board on the KLSE, called the Main Board, until the establishment of the Second Board in November 1988. The Second Board complements the Main Board and provides an opportunity for smaller companies that have great potential to grow but do not meet the more stringent listing requirements of the Main Board. Each trading board is further classified by sectors, which reflect the core business of the companies. As part of its aggressive push to become an Asian-Pacific hub for information and communication technology, in October 1997, the Government of Malaysia launched the Bursa Malaysia of Securities Dealing and Automated Quotation (MESDAQ) as a third board of the Malaysian stock market. The MESDAQ is intended as an avenue for small and medium enterprises in technology-related areas to raise capital.

As of 30 March 2007, a total of 1,023 companies were listed on Bursa Malaysia with market capitalisation of nearly RM990 billion (£140 billion) where the Main Board companies have the vast portion of nearly 78% of total market capitalisation, and the rest are 15% for Second Board and 7% for MESDAQ companies. The number of companies listed on Bursa Malaysia has increased almost five-fold since the incorporation of the exchange back in 1973. The development in the Malaysian stock market shows that the stock market in Malaysia is slowly improving and growing with investors gaining more confidence to participate in the trading of securities in the stock market and more companies seeking to list their shares on the stock market.

2.3 Trading on the Malaysian stock market

Trading in Bursa Malaysia is largely dominated by individual investors with more than half of trades generated by them. Institutional investors usually trade sporadically in larger volumes than individual investors. Day traders and contra traders also play a role in the Malaysian market even though they are not dominant. Day traders refer to people who completed a round trip to buy and sell transactions within the same day. Contra traders refers to people who completed a round trip to buy and sell transactions before the settlement period is due. It means that for day and contra traders a profit or loss is made on the difference or margin between the buy and sell price, less transactions costs, without committing any prior capital upfront. Contra trading was extremely popular among investors when the settlement period was longer back then. However, contra traders activities appeared to be reduced when the settlement period was shortened from seven days to three days in 1999.

As the stock market is dominant with individual traders, the market is highly speculative when trading volume is high or when the market seemed ‘hot’. Rumours also play a big role in the stock market when individual investors are dominant. Casual inspections from the Bursa Malaysia website show that some companies are heavily traded or have substantial price changes without the arrival of any new information or official news release or corporate announcement.

Within the Asia-Pacific region, the Malaysian stock market is relatively small in terms of market valuation and trading volume. For example, the market capitalisation of the Malaysian stock market as at end of March 2007 was nearly US\$300 billion. Compared with the largest market capitalisation in the Asia-Pacific region, the Tokyo Stock Exchange’s market capitalisation is almost US\$5,000 billion, which is nearly twenty times bigger than the Malaysian stock market.

Trading volume in the Malaysian stock market is also relatively low compared with the other exchanges within the Asia-Pacific region. For example, monthly share turnover velocity for Bursa Malaysia in March 2007 is 46%, compared with Singapore at 61% or Tokyo at 126%. For the U.S. market, share turnover velocity at the New York Stock Exchange (NYSE) and the NASDAQ (National Association of Securities Dealers Au-

tomated Quotation System) is 143% and 269% respectively. Monthly share turnover velocity is share turnover during the month divided by market capitalisation at the end of the month. It measures the level of market liquidity, where bigger numbers mean higher liquidity. Even though the numbers are not entirely comparable due to differences in reporting rules and calculation methods, it clearly shows that market liquidity in the Malaysian stock market is substantially lower than the developed market (World Federation of Exchanges, 2007).

2.3.1 Trading system

In the early days, trading on Bursa Malaysia was conducted through an open-outcry system. Orders were sent to the brokers on the only trading floor on Bursa Malaysia, where buy and sell prices and its trading units were matched manually on the trading floor. As the constraint of manually matching increased, since 1992 Bursa Malaysia has operated a fully automated trading system. With the implementation of the computerised matching system, the trading floor ceased to exist and it can now handle big trading volume more easily. Most of the brokers now have their offices all over the country where they can meet and take clients' orders. Most of the brokers' offices now have big screens for the public that display information such as current prices, high and low prices for the day, bid and ask prices and volume traded.

Since the closure of the trading floor, all buy and sell orders are now automatically matched through a centralised limit order book system. Like the old system, all orders have to go through a brokers' dealer who will enter the bid and ask prices into the brokers' terminals. So, transactions are order-driven submitted into the brokers' limit order book. As such, there is no market maker on Bursa Malaysia. Previous study have shown that the properties of stocks traded using the computerised limit order system are no different from stocks that are traded using the market maker system (Ahn et al., 2001; Berkman and Koch, 2007; Chung et al., 1999).

2.3.2 Trading hours

Trading takes place five days a week Monday to Friday, except on public holidays and other market holidays. There are two trading sessions on any market day: the morning session from 9:00 a.m. to 12:30 p.m. and the afternoon session from 2:30 p.m. to 5:00 p.m. The transaction day is denoted as day 't', whilst the following trading day will be denoted as day 't+1' and so forth. Orders may be entered between 8:00 a.m. and 12:30 p.m. and between 2:00 p.m. and 5:00 p.m. Orders entered for each of the two trading sessions in a day are good for that session only. Unexecuted orders at the end of a trading session have to be re-entered into the system for execution.

2.3.3 Transaction cost and clearing

All trades must be cleared via the t+3 Rolling Settlement System (T+3 RSS), whereby a settlement must conclude no later than t+3, i.e., the third trading day after the transaction day. Trading of shares on Bursa Malaysia involve the following costs: brokerage fees, clearing fees, stamp duty and registration fees. Effective 1 July 2002, the brokerage fee is fully negotiable subject to a maximum of 0.70% of the contract value. A typical transaction cost is nearly 1% of the contract value, while the same day buy and sell trades cost less than 1%.

Transaction cost in the Malaysian stock market is fairly comparable with other stock markets. For example, transaction cost on the Singapore stock market is around 1%, while transaction cost on the Hong Kong stock market is only around 0.6%.

2.3.4 Trading lot and tick size

Shares are normally traded in a specific number of units called board lots. This means that every time a trader sends an order, he will quote the volume in terms of lots. Since 26 May 2003, trading board lots have been 100 units. The change marked the standardised board lot reduced from 1,000 units to 100 units. Any amount of units less than board lots are called special lots or odd lots. Bursa Malaysia reported that the main reason for the introduction of a smaller trading lot was to reduce the occurrences of odd lot.

The difficulty of matching the volume of buy and sell order makes the trading of odd lots unattractive. In this sense, reducing the trading lot makes the security easier to trade, thus, helping to increase trading volume. Bursa Malaysia reported that there was an increase in the trading volume for the Second Board within two weeks after the introduction of reduce board lot compared with the same period before the beginning of reduce board lot. However, the report was inconclusive since the total market trading volume did not increase during the same period.

Tick size is the permissible minimum change on the offer to buy price over the previous done or quoted price. Tick size falls according to different price ranges as stated below:

<u>Market Price Range</u>	<u>Tick Size</u>
Below RM1.00	RM0.005
RM1.00 up to RM2.99	RM0.01
RM3.00 up to RM4.98	RM0.02
RM5.00 up to RM9.95	RM0.05
RM10.00 up to RM24.90	RM0.10
RM25.00 up to RM99.75	RM0.25
<u>RM100.00 and above</u>	<u>RM0.50</u>

A practical example of the use of minimum bid is as follows. Supposed that a company X's last price is RM3.10, so its minimum bid is RM0.02. So, for any potential buyer, the least bidding price is RM3.08, while for potential seller, the least asking price is RM3.12. In terms of the pricing of stocks, although there are more than a thousand companies listed on the stock exchange, nearly half of the companies listed on Bursa Malaysia were traded less than RM1.00 as of 16 May 2007. Out of 1,032 stocks, 24 stocks (2%) were traded over RM10 (£1.40), while nearly half of the stocks traded for less than RM1 (14 pence). It means that the absolute stock prices in the Malaysian stock market were relatively low.

With the trading board lot now at 100 units, trading in the Malaysian stock market is relatively cheap where investors can buy a share of a stock with just RM100 (less than £15). In the U.S., stocks that are traded at less than US\$5 per share are commonly called penny stocks, while in the U.K., penny stocks are stocks that are traded at less than £1 per share. Penny stocks are considered a high risk investment as it is easy for investors

to manipulate the prices (U.S. Securities and Exchange Commission, 2006). Chatterjea et al. (1993) provide a detailed review of the literature in market manipulation. Besides manipulation based on the releasing of inside information or spreading false rumours, market manipulation can also occur due to excessive buying or selling of securities. For example, ‘short squeeze’ is an activity to manipulate share price by purchasing significant amount of common stock in the whole market including option/futures products, and then selling the stock at higher prices. It is therefore easier to manipulate penny stocks; however, in the Malaysian stock market, there is no empirical evidence to suggest the existence of similar attributes of penny stocks as found in the U.S. markets.

2.4 Dissemination of news announcements

Since the fourth quarter of 1999, the Malaysian stock market has initiated an electronic system for the listed companies to send news announcement through electronic means. With the implementation of the new system of dissemination of information, companies can send news announcements electronically to Bursa Malaysia during the day. However, if the announcement is deemed important enough that it might move the market, then the news will be released after the market is closed. It is to ensure that the news will not give any shock to prices. Once the news has been verified, it will be displayed in the company announcement section in the stock exchange’s official website. Investors will then be able to read the announcement online.

Although the Internet penetration through the use of broadband in Malaysia is relatively low, most investors are living in urban and sub-urban areas. Many of them have the broadband infrastructure so that they can have access to the Internet. Before the implementation of the electronic news dissemination, the listed companies would send the news in hard copies to Bursa Malaysia. Bursa Malaysia would then distribute the news to the brokerage companies. The electronic system has simplified and improved the communication channel, and increased the communication and distribution of information. Companies can easily and immediately send new announcements. In this way, companies are able to inform investors immediately and timely about any new developments in the

company. Investors can easily and immediately be informed on the new development and the new announcement will help investors make decisions faster and more effectively. Investors can easily browse through the Bursa Malaysia's official website to obtain company news and information faster than the usual ways such as from the television, newspaper or conference calls.

Nowadays, many stock exchanges around the globe have implemented company news updates electronically through the exchanges website, in addition to the conventional way of communication with the media. However, the speed of the news delivery and the content of information displayed on the respective exchange's websites could be considerably varied between each other.

2.5 Financial analysts in the Malaysian stock market

A financial analyst is a person who analyses economic and financial data and writes reports on the subject they are covering. The analyst reports can be a company or industry reports as well as reports on certain countries or regions. The financial analyst usually works for banks, insurance companies, mutual and pension funds, securities firms, and other businesses, helping these companies or their clients make investment decisions. The financial analyst also analyses bonds and loans issuers by evaluating the ability of companies or governments that issue bonds to repay their debt. On the basis of their evaluation, a management team assigns a rating to the bonds.

In the research, we are interested in the financial analysts that work for the brokerage firms, widely known as sell-side analysts in the U.S. The main job of the sell-side analysts is to evaluate companies for future investment and supply the information to their clients and market participants. In producing the reports, the analysts get information by meeting the company's management, visiting the company's plant as well as analysing the company's accounting records. It is very common that the analysts will place recommendations on the companies they are covering, typically phrased as 'buy', 'sell' or 'hold'. Some analysts reports appear in major newspapers such as the U.S. Wall Street Journal, even though most of the reports are delivered to the analysts' clients first before

they are published. Meanwhile some reports are for private clients or paid subscribers only such as Bloomberg Financial Services.

In Malaysia, most of the company reports are produced by financial analysts who worked with the brokerage companies. As the main job of financial analysts is to provide investment advise, their practises are governed by the law. Like the practice of many stock markets around the world, in Malaysia, the practising of investment advisory is governed by the Securities Industries Act 1983 (the Act). The Securities Commission which is equivalent to the Securities and Exchange Commission (SEC) in the U.S. is responsible for licensing and regulation of Investment Advisers and Investment Representatives including the financial analysts. For example, Section 39 of the Act outlines measures to be taken to ensure disclosure of interests. Among others, the analysts must disclose their interest or if their employer has any interest direct or indirect in the companies that are mentioned and recommended in the analysts' reports. The Act also requires that records of analysts recommendations are to be kept for seven years.

The Act also sets the requirements for the application to become a financial research analyst. Among others, it requires that the candidate has relevant professional or tertiary qualifications, such as a degree in finance, economics, accounting, commerce or law, with at least three years of direct and relevant experience in investment advisory activities. If the applicant does not have any professional or tertiary qualifications, he should have at least five years direct and relevant experience in investment advisory activities.

The Act also requires the employer of the financial research analyst to notify the Securities Commission of the appointment of the analyst. If a candidate lacks any of the requirements set out above, the Securities Commission may reject it. The successfully appointed research analyst shall pass examinations determined by the Securities Commission from time to time. The employer must also notify the Securities Commission within 14 days if the analysts resign from their position.

A career as a financial analyst in the Malaysian financial market is relatively new and small in terms of number of employees. This is due to the nature of a relatively small capital market. Therefore, there is no organisation that monitors and ranks the performance of financial analysts in a league table like those in the U.S. The lack of

monitoring performance of the financial analysts might contribute to the adverse selection problem in identifying and measuring the quality of the analysts.

Currently there are more than 20 brokerage companies in Malaysia. Foreign brokerage companies are not allowed to directly trade in the market. However, foreign companies are allowed to open their branch with their offices registered in Malaysia and they must follow certain rules on the ownership and employment of the workforce in the companies. Since there is only one exchange in Malaysia, the operating of an exchange is quite a profitable business. Despite the fact that the transaction cost is merely less than 1% of trading value, it is chargeable to both buyer and seller, so the stock exchange needs to attract a lot of trading volume to remain profitable. Since its incorporation into Bursa Malaysia as a company by limited shares and being the only exchange in Malaysia, Bursa Malaysia has enjoyed a continuous high trading volume. It can be seen from the continuous profit disclosed in the annual reports of Bursa Malaysia (Bursa Malaysia, 2006).

Although the company reports produced by the analysts could be useful to investors, not every brokerage company has their own research team to produce the reports. This is due to the high cost of operating a research department. The profession of financial analyst is highly regarded as a well-paid job but it is also a very demanding job as it requires a lot of travel, factory visits and management meetings. Although we do not have data on the number of analysts employed by the brokerage companies in Malaysia and their salary, based on conversations with people in the industry we expect that the financial analysts activity in Malaysia is still in its infancy; that the activity is relatively low compared with that in the developed markets. Thus, we also expect that analysts' earnings could be one of the highest among fresh graduates.

In Malaysia, the company reports produced by the financial analysts are mainly for their clients' circulation, except for a few reports that are released to the public as 'second-hand' information. Based on casual observations of the number of analysts reports available at the Bursa Malaysia's library, we can safely assume that more than half of companies quoted on Bursa Malaysia are not covered by financial analysts.

2.6 The incentive scheme of financial analysts research

Previously in Section 1.4, we have mentioned about the assistance offered by some exchanges around the world in the effort to promote small and medium companies that are listed in the respective stock exchanges. By promoting these companies, it can attract investors' attention to invest and trade in the shares of these companies. The Singapore Exchange is probably the first stock exchange to implement assistance in the form of financial analysts' coverage commencing in 2004. In Europe, Euronext announced in February 2005 that intermediary experts will be assigned to offer research and a sales team to help small and medium companies listed in Euronext. In the U.S., NASDAQ and Reuters announced in June 2005 the formation of a new company to help small size companies to obtain financial analysts' coverage (World Federation of Exchanges, 2007).

The common purposes of the assistance provided by the stock exchanges mentioned above are to improve liquidity and visibility, especially in the small and medium size companies, and to increase the markets understanding of the prospect of many companies listed on these exchanges that are not reported by the analysts. Indirectly, the assistance offered by the stock exchanges will help to increase trading of shares in the stock market (World Federation of Exchanges, 2007).

Similarly in Malaysia, it is evident that Bursa Malaysia acknowledges the importance of financial analysts coverage for the companies listed on its exchange. In November 2004, Bursa Malaysia received a grant of RM7.5 million (£1.1 million) to promote financial analysts research on small capitalised companies. As the activity of financial analysts research is still lacking and in line with the effort to provide publicity and promotion of companies listed on the stock exchange, Bursa Malaysia would implement an incentive scheme of financial analysts coverage scheduled to commence in January 2005.

Bursa Malaysia believed that providing consistent and timely information to investors would lead them to better-informed decisions and greater understanding of companies listed on the stock exchange. Eventually, the incentive scheme of financial analysts coverage would lead to greater transparency, improve the public perception on the transparency

of listed companies, and attract investors attention to trade. An increase in trading volume would eventually increase liquidity. In other words, Bursa Malaysia aimed to increase promotion, visibility, trading volume and liquidity of the participating companies (Bursa Malaysia, 2004). Explicitly, the authority was not concerned with the valuation of the companies that were participating on the incentive scheme, however, as we will discuss in Chapter 4, the literature shows that company's valuation is associated with investors attention and therefore the incentive scheme is relevant.

The trial incentive scheme was started in 2005 and initially the scheme would continue to run for two years. Operationally, the incentive scheme in Malaysia is similar with the one that is run in Singapore. Basically, the listed companies participating in the scheme would have to pay a certain amount of money to Bursa Malaysia, while the financial analysts involved in the incentive would be paid for providing the company research reports. By participating in the scheme, each company would receive continuous and updated coverage from two financial analysts. The analysts' report would be available online only from the Bursa Malaysia's website. Even though the scheme was open for all listed firms on Bursa Malaysia to apply, only the first hundred listed companies would be eligible to participate in the first batch of the incentive scheme. Similarly, the brokerage companies were invited to participate in the incentive scheme. Bursa Malaysia would select the listed companies and brokerage companies that would be participating in the incentive scheme. Effectively, Bursa Malaysia was the administrator of the incentive scheme (Bursa Malaysia, 2004).

Bursa Malaysia also aimed to ensure that small capitalised companies would receive consistent and continuous financial analysts coverage. The cost of financial analysts coverage would be equally shared between the participating companies and the stock exchange. As an incentive, the research companies would be paid for each company they covered (Bursa Malaysia, 2005). As the cost of initiating financial analysts coverage is relatively high, the incentives received by the research companies might not be sufficient to cover the whole cost. Nevertheless, the research companies might view the exercise as a goodwill to the authority and to show a good example to other companies by participating in an incentive scheme. Moreover, the research and brokerage companies participating in the

scheme would be displayed in the stock exchange's website. Eventually, it would attract investors attention in the research or brokerage companies which was also beneficial to the companies involved.

Explicitly, the research firms were required to produce one initiation of a coverage report, four results reports corresponding to quarterly results and full year results and update reports. All the research reports would be made available to the public free of charge. Bursa Malaysia would allocate the participating companies to the research firms through an independent committee. In January 2005, Bursa Malaysia reported that 17 research firms had shown interest in participating in the scheme (Bursa Malaysia, 2005).

In a media release issued on 18 April 2005, Bursa Malaysia reported the release of the first round of companies reports on the initial 100 participating companies. The research reports were freely accessible through the official website of Bursa Malaysia. Bursa Malaysia was hoping that with the release of the analysts reports, it would spur interest in the companies listed on the stock exchange and provide investors with more informed decisions. Bursa Malaysia was also hoping that more listed companies would participate in the scheme as a way for the listed companies to build credibility and confidence among investors in the listed companies (Bursa Malaysia, 2005). As the scheme was opened to all listed companies, there were also a few big companies taking part in the scheme.

Obviously, the incentive scheme would improve and increase more coverage on small and medium size companies. It is because there were many potential small and medium size companies that were not reported in the media. As mentioned in the earlier chapter, the existing practise of financial analysts coverage is not in favour of small and medium size companies. The implementation of the incentive scheme would encourage the brokerage companies to divert some of their resources by reporting the small and medium size companies as well.

Basically, the incentive scheme was introduced with three main objectives, namely, to develop the investors relation culture in listed companies by building a bridge between companies and investors, and ensure correct company profiling with a constant and consistent information flow; to develop and increase the pool of analysts; and to increase

information flow to the public by providing credible and consistent updates on companies, thereby expanding investor choices. After a two year trial period, there are now more than 300 listed companies and 21 research companies participating in the scheme including Standard & Poor's, the world's largest producer of independent and investment research. Bursa Malaysia viewed the incentive scheme a success as the research reports were extensively distributed by all parties involved in the scheme. The participating companies are free to distribute the research reports their shareholders, while the research companies are free to send the reports their clients. Due to positive feedback from investors and the participating companies, the second phase of the scheme has already commenced in November 2007 (Bursa Malaysia, 2007).

As it is important to attract the flow of investment from foreign and local investors, Bursa Malaysia emphasises the importance of market efficiency and Bursa Malaysia has made great strides in developing efficient trading and market infrastructure and improving transparency and market efficiency. This is evident from the 2007 annual report of Bursa Malaysia where its mission statement says that Bursa Malaysia offers a fair and orderly market that is easily accessible with diverse and innovative products and services.

2.7 Summary

This chapter has provided a brief history and overview of the Malaysian stock market. We learned that even though the Malaysian stock market has existed for more than 70 years ago, it is relatively small in terms of market capitalisation compared with other markets in the Asia-Pacific region. We also learned that the liquidity in the Malaysian stock market is very low compared with the other more developed markets such as the U.S. or the U.K.

This chapter has also briefly described some changes in the market microstructure that had taken place on the Malaysian stock market in the past decades; in particular, changes of trading system from an open out-cry trading to the computerised matching system, a reduction in trading clearance and settlement period from seven days to three days and also a reduction of standard trading board lots from a thousand units to one

hundred units. At a casual glance, those changes have an immediate impact in increasing the trading volume. However there is no published academic research to conclusively support the evidence that a reduced trading cost due to the microstructure changes had taken place.

Finally, this chapter has described the incentive scheme of analysts research initiated by Bursa Malaysia. Like any other stock market, the lack of analysts coverage and reporting especially among the small and medium size companies is evident. By implementing the financial analysts research scheme, the Malaysian stock market's aims were to promote the companies, increase trading volume and liquidity in the stock market. As such, the scheme is still running even after passing the two year period since its implementation. It is very likely that the scheme will remain in place for some time. As the scheme is the first ever tried in the Malaysian stock market, studying the impact of the scheme will be an interesting research to undertake.

Chapter 3

Information Asymmetry In The Financial Markets

3.1 Introduction

In the previous chapter we have explained the changes in the microstructure of the Malaysian stock market that happened in the past decades as well as the new arrangement of an incentive scheme to increase financial analysts coverage in the Malaysian stock market. Since the initiation of financial analysts research means that there will be more information available through the publication of analysts reports, the aim of this chapter is to provide a literature review on theories linked by information and asset prices. In particular, this chapter introduces and discusses the Kyle's model and some extensions of Kyle's work. We use the Kyle's model as it provides the theoretical premise and the initial seminal groundwork on the effects of private information and information asymmetry on prices and trading activity. As the role of financial analysts is to produce information, which we will describe in Chapter 4, we are able to relate the Kyle's model and financial analysts coverage with asset prices. This chapter therefore provides a review of theoretical understanding of price formation under the presence of asymmetric information.

3.2 Relation between information and prices

The relation between information and prices has been widely documented in the literature. In the Walrasian or Classical model of competitive equilibrium, the amount of goods demand at a certain price will be cleared by the amount of goods supplied at a matching price. In this model, the role of price is to match and clear the market order with the assumption that all relevant information in determining the prices had been already accounted for. It means that prices convey all the information necessary for market participants to make optimal decisions (Lee, 1998).

In the financial markets, some participants may receive private information on the future state of the asset. In other words, some investors are better informed than those who do not receive the private information. Of course, investors who have access to private information knew more about the value of the asset, and thus they have more advantage than investors who have no information. This creates information asymmetry among market participants. The prevalence of information asymmetry is inevitable and common in any market or economy (Stiglitz, 2003). Therefore prices under the classical Walrasian model do not reflect individual agents' information about future states of the asset, and prices do not contain all relevant information such as the quality of the asset or investors' preference for a particular asset that will affect prices (Grossman and Stiglitz, 1980; Lee, 1998).

In contrast to the theory that prices convey all information as in Fama (1970), Grossman and Stiglitz (1980) argue that prices will never reveal all information because if prices reflect all information then there is no incentive for market participants to acquire and search for more information. Furthermore, the effects of noise in any market in the world is profound. Although the prevailing noise in the financial markets causes markets to be relatively inefficient, it often prevents people from taking advantage of the inefficiencies. Noise makes it very difficult to test either practical or academic theories about the way financial or economic markets work (Black, 1986). The prevalence of information asymmetry and noise trading will delay prices to convey or reveal all information (Kyle, 1985); hence, asset prices do not always reveal their true theoretical value in the real world.

The difference of asset pricing between its true theoretical value and the observed value is called anomalies. Even though there is no consensus on the definition of anomalies in the literature (Fama, 1998), anomalies often refer to empirical results that seem to be inconsistent with theories of asset pricing behaviour. Anomalies indicate either the market is inefficient or the model used to model asset price is inadequate (Schwert, 2003). The substantial time taken before an anomaly can be recognised in the financial market is due to a slower rate of diffusion of information among investors before an anomaly can be identified. Investors will take some time to recognise and ensure that an anomaly does exist (Merton, 1987). Therefore, investors who have identified the anomaly earlier than other people might be able to earn superior return before the anomaly is widely recognised.

For example, Barnes (1986) finds evidence of prevailing thin trading and weak-form efficiency in the Malaysian stock market. Barnes was among the early authors who published a study about the Malaysian stock market. He shows that trading in the stock market is low in liquidity and the prices only have incorporated past information about the stocks. A pattern of seasonal daily return was observed in the Malaysian stock market prior to 1990; however, it almost completely disappears when using data after 1990 (Clare et al., 1998). The evidence of price seasonality in the Malaysian stock market is also supported by Pandey (2002). Using data from 1992 to 2002, Pandey finds that the average returns in the months of February and December are statistically significant and are different from all other months. The average return for December is positive and the highest. The evidence of seasonality implies that the Malaysian stock market is not informationally efficient. The results imply that there is an anomaly in the Malaysian stock market.

However, Fama (1998) and Schwert (2003) suggest that most of the anomalies do not seem to hold up as they disappeared once the papers highlighting them were published, or when investors recognised the existence of the anomalies. Even if the anomalies existed in the sample period in which they were firstly identified, the activities of practitioners who implement strategies to take advantage of anomalous behaviour could cause the anomalies to disappear. For example, the January effect observed in the U.S. market, where stock

prices substantially increased in that month, was documented in earlier literature but it is now less pronounced in the later literature.

Due to the strong relation between the disclosure of information and asset prices, there is a strong case for the proponent of the efficient markets theory to underpin regulation concerning the dissemination of price and quote information in financial markets. Without the publication of prices and quote information, market participants will not have sufficient information to be adequately informed, asset prices will therefore not be informationally efficient and allocation of resources will also not be efficient (Lee, 1998).

For example, recently the SEC had moved further by implementing the Regulation Fair Disclosure (Regulation FD) effective October 2000. The regulation will further enforce public listed companies to disclose material information immediately. Prior to the Regulation FD, companies would usually disclose material information to selected parties only, such as banks, brokerage companies, or the companies' major shareholders. With the new regulation, no parties are deemed to have advantage of new information (U.S. Securities and Exchange Commission, 2007b).

The relation between information and asset prices can be explained using the models of microstructure. Literature in microstructure models are a range of studies that investigate the implications of disseminating different types of price and quote information in various market structures on price discovery and liquidity; the consequences of transparency; the role of information plays in the process of price discovery are among the topics deemed essential. Understanding the market microstructure could therefore explain anomalies in asset prices (Lee, 1998; O'Hara, 1995). O'Hara (2003) argues that the asset pricing model ignores the fact that information is not symmetrical and price equilibrium is not revealing, and therefore asset prices must incorporate the transaction costs of liquidity and the risk of price discovery.

Microstructure models show that liquidity measures such as spreads, depth and volume is a cost borne by investors. If these costs are large enough they should negatively effect asset prices because of their impact on net asset return. In the same vein, reducing these costs through the introduction of a more efficient trading mechanism should have an immediate positive impact on an asset value. Microstructure models have also extensively

analysed the price discovery process, typically only in the context of transactions costs confronting traders. Price discovery involves the incorporation of information into asset prices. O'Hara (2003) also argues that the price discovery process impacts upon asset price behaviour. Under asymmetric information, it changes the nature of the risks that agents face as some agents have more information than others. The risk aspect of price discovery has not been included in the microstructure models. Just as liquidity effects can affect traders' returns, price discovery can also affect traders' risk. The microstructure of market matters because it influences the informational content of prices and other market information. Changing a stock's microstructure may thus induce price changes due to enhanced liquidity and greater informational efficiency in trading prices.

Another new strand of research that can explain the diversion of asset prices from their theoretical values is behavioural finance. Behavioural finance refers to the study of the applications of cognitive psychology to understanding the pricing of financial assets and the implications of less than fully rational behaviour on the part of some market participants. In broad terms, behavioural finance argues that some financial phenomena can be better understood using models in which some agents are not fully rational. Although rational agents will prevent them from influencing security prices, theoretical papers in behavioural finance show that in an economy where rational and irrational traders interact, irrationality can have a substantial and long-lived impact on prices (Barberis and Thaler, 2003).

As a consequence that investors are not being fully rational, some investors may overreact, while some may underreact to certain events or phenomena based on investors' overconfidence about the precision of their private information and biased self-attribution (Daniel et al., 1998). Overconfident investors may trade irrationally. Irrational traders cause deviations of asset prices from fundamental value. Irrational occurs due to biases that arise when because people form beliefs, and on people's preferences, or on how they make decisions, given their beliefs. Psychology is therefore the second building block of behavioural finance, which catalogues the kinds of deviations from full rationality we might expect to see. Extensive experimental evidence shows that many people are overconfident and optimistic in their judgments (Barberis and Thaler, 2003).

We have shown that models incorporating information in the price formation of financial assets is now growing and dominant, hence our literature review is by no means exhaustive. In summary, we conclude that information is important in determining asset prices.

3.3 The impact of information asymmetry

Although information asymmetry is inevitable and a natural phenomenon in any economy due to the inherent prevalence of imperfect information in the real world, the prevailing information asymmetries can also be purposely and intentionally created (Stiglitz, 2003). For example, managers of a company or insiders are able to earn abnormal returns because they have access to vital information on the company's research and development (R&D) that have not been disclosed to the public yet (Aboody and Lev, 2000). The U.S. SEC defines an insider as officers, directors, and employees of the company (U.S. Securities and Exchange Commission, 2008). In this case, managers who are the employees of the company can exploit the information asymmetry so that they can make profit from the information.

As the prevalence of information asymmetry is pervasive in any market, the immediate impact of information asymmetry will depend on the type of markets. For example, information asymmetry in the insurance market would cause the premium payable by consumers to increase as the insurance companies could not rely on the information (Stiglitz, 2004). Information asymmetry in the used-car market would cause the price of a good quality car to lower which would be detrimental to the seller. On the other hand, a low quality car could be sold at a higher price as information on the quality of the car is not known by the buyer (Akerlof, 1970).

In any market, asymmetric information is said to arise when market participants are differently informed such that one party has more information than the other party. In the financial market, the information asymmetry problem mainly occurs in individual stocks where certain people who are directly or indirectly related to the company knew more about the company. Hence, it is unlikely a trader has market-wide private information

(Subrahmanyam, 1991).

An investor is deemed to be informed if he can arrive at reliable conclusions about whether financial assets are fundamentally overvalued or undervalued. The informed investor understands the intrinsic value of the asset better than the others because he has better access to fundamental data and can better analyse the implications from his data (Harris, 2003). The investor may become informed due to his contact with people who have direct or indirect access to news inside the company.

Obviously, it is natural that somebody will know more than another. The reason for the asymmetric information to occur in a company is because important information, either intentionally or unintentionally, is not disclosed to the investors. Investors who have access to private information regarding the affairs of the company would know more about the future asset value, thus have an advantage over the investors who do not have access to private information (Eleswarapu et al., 2004).

Although in the real world asymmetric information appears not to be an ideal situation, Grossman and Stiglitz (1980) argue that asymmetric information is fundamental to market equilibrium. In other words, asymmetric information is needed in order to clear the price in the market. The market clears the price because of differences in expectation and beliefs as well as changes and revisions of beliefs amongst investors (Karpoff, 1986). If all information were contained in prices, no one would have an incentive to search and acquire information. In equilibrium, some people refrain from gathering information or do not have access to news, while others incur costs in searching for information.

With the presence of information asymmetry, investors' efforts of searching for information are compensated in the form of higher returns (Grossman and Stiglitz, 1980). Fama (1991) agrees with Grossman and Stiglitz (1980) that for the prices to fully reflect the information on the asset, it is conditioned that there is no trading costs or any costs involved to acquire information. Even if there is a cost involved in acquiring information, the benefits of acting on the information should not be more than the marginal cost.

Akerlof (1970) argues that the impact of information asymmetry will result in price inefficiencies and a thin market. Price inefficiency means that the price does not incorporate the information, and as a consequence the market will become thin as investors will

shy away from the market that is not efficient. The implication of a thin market means that it is difficult for the orders to be matched and executed. At the extreme level, information asymmetry could bring the whole market down and eventually collapse.

As mentioned in an earlier section, information is closely related to prices, thus the impact of information asymmetry on firm value and asset prices has been widely analysed in the finance literature. For instance, O'Hara (2003) argues that models of asset pricing assumed a symmetric market and ignored the fact that information asymmetry is inherent in the market, hence information asymmetry affects asset pricing. Stiglitz (2003) suggests that information asymmetry in the capital market could explain some anomalous aspects of corporate behaviour which has been discussed in Section 3.2.

Kyle (1985) shows in his model that an investor who has private information trades strategically to maximise his profits. In his model, Kyle (1985) indirectly shows that the presence of insider trading or information asymmetry caused the absolute price difference between the asset true value and trading price to increase. Therefore, the uninformed investor demands a higher premium when an informed investor exists in the market. The presence of more informed traders thus gives discount to current share price to compensate the uninformed traders for taking the risk (Wang, 1993), and, therefore asset prices could decrease when there is no change in the expectation of future asset price.

Rumours are also another form of information asymmetry caused by the spread of false or incomplete information. The impact of rumours is that it drives the market price beyond the true value with positive probability. In particular, information asymmetry between the rumourmonger and uninformed traders gives the rumourmonger the opportunity to trade twice, firstly when he receives information, and secondly when he knows the price to be overshooting. In equilibrium, a rumourmonger who spreads false information could also cause an increase in information asymmetry and, therefore, a rumourmonger increases his profits at the expense of uninformed traders (Bommel, 2003).

The impact of asset price increase due to a decrease in information asymmetry is supported by Diamond and Verrecchia (1991). They argue that a large company can increase its stock price by disclosing information only to large institutional investors and then timing the release of the information known to the public. The release of information

to large institutional investors gives an incentive to trade in the company's shares. By attracting demand for large holdings from institutional investors, stock prices could rise. For a small company, attracting the large holdings will have a minimal impact on the current price because the size of position is not large even when divided between a small number of investors (Diamond and Verrecchia, 1991).

Essentially, the literature shows that the changes in the prevailing asymmetric information among investors will result in substantial stock price changes. It is because reducing the information asymmetry would cause an increase in demand for shares as in Diamond and Verrecchia (1991) or an increase in investors' confidence as in Doukas et al. (2005), or a decrease in risk premium as in Wang (1993); therefore the impact of reducing information asymmetry is an increase in security prices or the company's valuation (Lang et al., 2004).

As information asymmetry causes an increase in the required return, the cost of capital is also affected. Investors demand higher returns to hold securities that have greater private information. The higher return reflects the increased risk to uninformed investors for holding stocks with greater private information. Thus, private information induces a new form of systematic risk that in equilibrium investors require compensation for this risk (Easley and O'hara, 2004). Therefore, the presence of information asymmetry increases the cost of capital as the risk increases. This is supported by Wang (1993) who suggests that as long as there is an increasing fraction of uninformed investors in the market, the price contains less information about future growth, thus increasing the risk of investing in the stock. As such, a higher return or higher premium is required, leading to an increase in the cost of capital.

The uninformed investors will face adverse selection when the informed investors trade on the private information they have against the uninformed investors. The uninformed investors require additional premium as they face adverse selection trading with the presence of noise trading and also the more informed investors. Noise trading refers to the transactions motivated by investors' needs to liquidate or balance portfolio. The increased adverse selection faced by the uninformed investors cause higher price variability as a result of higher variability of expectation between the informed and uninformed

investors (Foster and Viswanathan, 1993; Wang, 1993).

The prevailing information asymmetry also affects trading activity (Akerlof, 1970; Glosten and Milgrom, 1985). In the financial market, Glosten and Milgrom (1985) show that presence of traders with superior information leads to a positive bid-ask spread even when the specialist is risk-neutral and makes zero expected profits. As a consequence, trading activity would be affected in that only a few trades can be matched and executed due to the bigger bid-ask spread. Furthermore, the uninformed or less-informed investors who are risk-averse would not be attracted to trade if they know the presence of investors with superior information in the market. Previous studies have supported the hypothesis that information asymmetry has severe affects on trading activity as measured by trading volume. The association between information asymmetry and trading is discussed further in Section 3.6.

3.4 Measure of information asymmetry

Even though the concept of asymmetric information is easy to understand, asymmetric information is not easily and directly observable, thus, makes it difficult to measure. Although there is no clear and direct test to detect the presence of information asymmetry, the surrounding events or phenomenon happened in the market could be perceived of having one. For example, in Foster and Viswanathan (1993)'s study, they implicate that information asymmetry is high on Monday when they find that the usually actively traded firms were traded unusually and significantly low on Monday. A possible explanation for the phenomenon is that investors are cautiously waiting for the effects of the weekend news on the market, thus asymmetric information among investors is high on Monday. This is consistent with Easley and O'Hara (1987) that the arrival of news is a major source of information asymmetry and the degree of information asymmetry does vary over time according to the amount of private information available to investors.

The impact of information asymmetry on firm value and stock prices has been analysed extensively in the finance literature. Firm value is usually obtained from the firms' accounting book such as book-to-market ratio or other financial ratios. If the firms'

securities are listed on the exchange, then the firms' stock price return volatility could be used as a proxy to measure information asymmetry. Many past studies measure the effects of information asymmetry based on the company's share price change or returns due the fact that the share price changes more frequently and is easily observable rather than the company's accounting book which requires considerable time and effort to audit. Therefore, by examining the changes in the share price, it gives direct evidence of the arrival of new information or the presence of traders with private information (Fama et al., 1969; Kyle, 1985).

Due to the inability to directly measure the degree of information asymmetry, many previous studies used proxies to measure information asymmetry (Easley and O'Hara, 1987). There is a variety of proxy variables used to measure information asymmetry. The measures could be divided into three broad categories; namely, firms' investment opportunity measures, analysts' forecast and market microstructure measures.

3.4.1 Investment opportunity-based measures

Common measures of information asymmetry under the category of firms' investment opportunity measures are company size, ratio of market-to-book value and earnings-price ratio (McLaughlin et al., 1998). Company size is used to measure information asymmetry because the asymmetric is more severe in small firms since only a few analysts cover small firms; as such, there is not much information available to investors. Therefore, the incidence of information asymmetry is higher and more prevalent in small companies (McLaughlin et al., 1998).

The ratio of market-to-book value is used to measure information asymmetry because it captures the difference between the companies' value and companies' asset. The ratio reflects growth opportunity which is the value of future investment opportunities available to the company. As such, a bigger ratio of market-to-book indicates greater presence of asymmetric information (McLaughlin et al., 1998).

The limitation of using company size and book-to-market as proxies to measure information asymmetry is that these measures are not independent. It is because small companies usually have high ratio of market-to-book value. The measures are also sub-

ject to considerable measurement error as the ratios can also be interpreted differently. For example, a company is having a high market-to-book ratio because of higher price charged for goods and services and not because of growth opportunities. Thus, the ratio does not fully capture the companies' growth opportunities (McLaughlin et al., 1998).

There are few other variables in this category used in the past studies to measure information asymmetry such as institutional shareholding. It is the proportion of shares held by institutional investors which is deemed as insiders because they have the potential to withhold and not to disclose sensitive information. Another variable is insider shareholdings which indicate the proportion of shares held by an individual that have interests in the company such as the board of directors or the management of the company. These people potentially have private information that they do not disclose (Brown et al., 2004; Cornell, 1992; Fogarty and Rogers, 2005).

Other company's characteristic such as the company's activity in the R&D is also considered to have links with information asymmetry. Aboody and Lev (2000) find that there is substantial insiders' abnormal return before the information on the R&D is disclosed to the public. The ability of the insiders to obtain significant profits is because they have private information not known to others, thus creating information asymmetry. Therefore, we argue that any event that brings in new information could be used as a proxy of information asymmetry.

3.4.2 Analysts forecast-based measures

Another way to measure information asymmetry is derived from convergence of opinion regarding the company's expected future earnings, obtained from consensus analysts' forecasts of earnings per share. It means that the dispersion of analysts' forecasts is a proxy to measure information asymmetry. A higher dispersion in analysts forecasts is a probable indication that some analysts have privileged information (Barron et al., 1998).

However, one critic of using forecast dispersion to measure information asymmetry is that analysts usually give favourable recommendations to companies in order to keep a good relationship with the companies (McNichols and O'Brien, 1997). Jegadeesh et al. (2004) show that analysts usually recommend 'glamour' stocks, i.e. positive momentum,

high growth, high volume, and relatively expensive stocks, partly due to higher brokerage fees generated by ‘glamour’ stocks. Therefore, analysts may overreact or underreact to information, thus analysts’ forecasts do not completely measure information asymmetry. Another critic for the using of analysts forecasts is that analysts forecasts may be correlated with the risks of the companies, and not the information asymmetry. In other words, some companies may be volatile in terms of earnings, and not in terms of information asymmetry (McLaughlin et al., 1998).

3.4.3 Microstructure-based measures

Another approach widely used to measure information asymmetry is using a microstructure approach. This is because estimation of information asymmetry is easy to operate without requiring a long time series of data or any models restriction.

Bid-ask spread is widely used as a proxy for information asymmetry. In the limit order market, the bid price is the price that investors are willing to pay to buy a certain security, while the ask price is the price that investors are willing to sell the security. In the market where market makers are in operation, the market makers set the bid and ask prices themselves. In many financial markets, the highest bid price and the lowest ask prices are usually disclosed and visible to investors, and the ask price is usually equal or higher than the bid price. The difference between the bid and ask prices is widely known as bid-ask spread.

A low bid-ask spread means that the security is easily and quickly sold with relatively low impact on price. Thus, a stock that has a low bid-ask spread is a reflection that the stock is highly liquid. On the other hand, a high bid-ask spread is an indication that the security is not easily or quickly sold. Existing literature further decomposes the bid-ask spread into three components: an order processing, inventory and adverse selection (Stoll, 1989). Order processing and inventory components represent operating costs of trading and record keeping, and the costs of holding the inventory. Adverse selection components arise because some traders are more informed about the company’s share prices than the other traders or market makers (Campbell et al., 1997).

However, there is also a potential disadvantage using a microstructure approach. The

estimates of adverse selection costs vary so much across studies making it difficult to regard any single study as conclusive. For example, George et al. (1991) report that the adverse-selection component, accounts for a much smaller proportion (8% to 13%) of the quoted spread, than the proportion (over 40%) previously reported in the literature. On the other study, Huang and Stoll (1997) estimate using 19 large and active stocks in 1992 and find that the adverse selection costs is also smaller between 6% to 18%. The big differences of estimation come from two sources, namely, due to different model specifications and the use of a different date in the data set. Clearly there is a need for more detailed and comprehensive analysis to gauge the explanatory power and stability of each model (Campbell et al., 1997).

Large trading order or block trading may also fall under the category of microstructure. Past studies suggest that large trades are associated with price movements resulting from inventory costs and asymmetric information (Hasbrouck, 1988; Seppi, 1990). Investors who trade in large volume and big block in a single transaction may have superior information not known to the public. Even if the transaction did not significantly move the price, the fact is the transaction involved in large volume did give perception of new information not yet revealed. Hence, the transactions of block trading or large volume traded are considered a proxy to measure the presence of information asymmetry.

Another measure of information asymmetry based on microstructure measures that is gaining attention in the literature is the Probability of Informed Trade (PIN). This is based on the market microstructure model developed by Easley et al. (1997). While it is new in the literature, this methodology has already been successfully used in the finance literature such as in Brockman and Chung (2002); Nemecek and Hanousek (2002) and Vega (2006). The PIN is a firm-specific estimate of the probability that a particular trade order originates from a privately informed investor, and hence, directly captures the extent of information asymmetry among investors in the secondary market.

Contrary to other measures of information asymmetry, the PIN is not directly obtained from a data set. The intuition behind the PIN model is that the presence of informed traders can be inferred from large imbalances between the number of buy and sell orders. As we observed order flow prices converge to their full information levels as the private

information fully revealed through trading activity of informed traders. Thus, we can estimate the probability of informed-based trading for a given stock over a particular period based on the daily order flow during the period (Brown et al., 2004).

The probability of informed trade at the beginning of the day has the following simple form:

$$PIN = \frac{\alpha\mu}{\alpha\mu + \varepsilon_b + \varepsilon_s} \quad (3.1)$$

where α is the probability of a private information event occurring, μ is the daily rate of informed trade arrival, ε_b (ε_s) is the daily rate of uninformed buy (sell) trade arrival. The PIN measure represents the expected fraction of trades that are information-based since the numerator is the expected number of orders from privately informed investors and the denominator is the expected total number of orders each day (Brown et al., 2004).

The measures of information asymmetry highlighted above are the ones that are well-used in past studies. However, due to the limitation of data available, the *PIN* would not be measured. The study used other proxies to measure the presence of informed trading such as the ones discussed in Section 3.7.1 and 5.3.3. As described earlier, the measure of information asymmetry is not directly observable, and thus, proxy measures are widely used to gauge the level of information asymmetry.

3.5 Price formation under information asymmetry

As information asymmetry is widely studied in various applications of fields in finance and economics, there are various models of information asymmetry in each literature such as models of information asymmetry in the wage efficiency or credit rationing or insurances (Stiglitz, 2003). In the financial market, Bagehot (1971) is among the first who provides models of asymmetric information in the financial markets. In his narrative model, he argues that market makers make little use of fundamental information. As market makers set the buy and sell prices, the role of market makers is to clear orders so that liquidity is always provided in the market, so investors who have new information will have the advantage of making profit from those who trade without information, regardless of the

structure of the market (Bagehot, 1971).

As mentioned by Stiglitz (2004), the presence of asymmetric asymmetry is pervasive in every aspect of life, and sometimes its presence can be purposely created and exploited (Myers and Majluf, 1984). Grossman and Stiglitz (1980) argue that asymmetric information and imperfect information is the main thrust in the financial market such that without information asymmetric there will be no market. According to Grossman and Stiglitz (1980), equilibrium prices will not reflect all information because investors need to be compensated for their costs of collecting information. If prices perfectly reflect all information, then there is no point in the gathering of information. For example, significant changes in the stock prices after the analysts recommendations were released as documented in previous studies (e.g. Boni and Womack (2006); Ryan and Taffler (2006); Womack (1996)) are indications that the recommendations bring in new information.

The market reacts to the analysts recommendations as investors view them as new information even though there may be no significant changes in the company's business. Therefore, according to Grossman and Stiglitz (1980), the superior return is to compensate the cost of gathering information on the analysts recommendations. Therefore, many price formations and innovation models are built based on the assumption of the presence of investors with private information such as in Kyle (1985) or Foster and Viswanathan (1993).

3.5.1 Kyle's model of price formation

The Kyle (1985)'s model is always a cited reference for the modelling of asset prices formation when the investor with private information is taken into account. It is because the Kyle's model simplifies and formalises the narrative theory of price formation proposed by Bagehot (1971). More importantly, the Kyle's model provides a foundation for the modern theory of market microstructure. Essentially, Kyle (1985) illustrates that modelling of price innovation as a function of quantities traded is consistent with modelling price innovation as a consequence of new information.

In the Kyle's model, there are three parties involved; market maker, informed investor and uninformed or noise investor. The market maker sets the price he is willing to buy

and sell. The role of market maker is to clear the market order to buy or sell at the price he set himself. Obviously, the market maker does not know whether the order comes from the informed or uninformed investor. The informed investor has private information of the true future value of the asset, while the uninformed investor trades to liquidate his investment or balance his portfolio. The market maker sets the price depending on the aggregate order flow such that he ends up with zero profit. If the demand is large, the market maker will raise the price since it may reflect demand by the informed trader who knows the true future value of the asset. Similarly, if the demand is low, the market maker will set a lower price.

The uninformed or noise trader submits an exogenous normally distributed order u . The informed trader optimally decides on his order x given his signal about the value v , where x is constrained by the informed trader's knowledge that a large order will reveal his information to the market maker and will cause the price to be set closer to v , leaving him with a smaller per-unit gain (Amihud et al., 2005). Kyle shows that there exists a linear equilibrium in which market maker sets the current price, p_t , after the market maker observes the current aggregate order flow, $u_t + x_t$, and the past price, p_{t-1} . The current price, p_t is given as follows,

$$p_t = E(v|u_t + x_t) = p_{t-1} + \lambda(u_t + x_t) \quad (3.2)$$

where λ describes the price change per unit of net order flow, that is, the market impact, which is an inverse measure of liquidity.

In a single auction equilibrium, λ is derived as follows,

$$\lambda = 2\sqrt{\frac{\sum_0}{\sigma_u^2}} \quad (3.3)$$

where \sum_0 is the variance of initial liquidation value v which reflects the informativeness of prices. A decrease in \sum_0 means that price is becoming more informative as the price incorporates more information. σ_u^2 is the variance of order flow from the uninformed trader. Kyle shows that at the end of single auction, one-half of the private information is incorporated into prices, or $\Sigma_1 = \frac{\sum_0}{2}$. Basically, λ describes the price change per unit of net order flow, or the market impact. $\frac{1}{\lambda}$ is the measure of market depth or liquidity which means that a smaller λ reflects higher liquidity, while higher λ means lower liquidity.

From equation (3.3), the Kyle's model shows that λ increases in the variance about v , that is stock liquidity decreases when the extent of asymmetric information increases. As described earlier, v is the final or liquidation value of the asset. A high variance of v means that the precision of information is low which is due to the extent of information asymmetry between the informed and uninformed trader. Essentially, stock liquidity declines as the variance of final value v increases due to the increased cost of trading. The cost of trading increases as the bid-ask spread increases due to the increase in variance of liquidation value. From equation (3.3), λ also declines in u , the level of variance of the uninformed investors' order flow. It means that stock liquidity increases when the variance of uninformed traders increases or in other words, stock liquidity increases when the amount of noise trading increases as it encourages the informed trader to trade more and leaves the informativeness of price unchanged.

By extending the single auction model to a sequence of auctions, Kyle derives the market depth and informativeness of prices for a given Σ_0 as follows,

$$\lambda_n = \frac{\beta_n \Sigma_n}{\sigma_u^2} \quad (3.4)$$

$$\Sigma_n = (1 - \beta_n \lambda_n \Delta t_n) \Sigma_{n-1} \quad (3.5)$$

where β_n is a constant value, and Δt_n is the time interval between auctions, and n is the number of auctions. From equation (3.5), Kyle shows that in a sequential auction, Σ_n decline monotonically as more trades occur. It means that as trades increase, more private information is gradually incorporated into prices. Kyle also shows that when the amount of noise trading increases, market depth increases as the informed trader is willing to trade more because his profit is proportionately increased, while the informativeness is unchanged. If the amount of prior inside information increases, then the market depth decreases proportionately. However, the informed trader's profit proportionately increases according to the amount of prior private information.

By further extending a sequential auction to continuous multi-period auction, Kyle shows that the market depth and informativeness of prices are derived as follows,

$$\lambda(t) = \sqrt{\frac{\Sigma_0}{\sigma_u^2}} \quad (3.6)$$

$$\Sigma(t) = (1 - t)\Sigma_0 \quad (3.7)$$

where $\lambda(t)$ in equation (3.6) is a constant, as compared with equation (3.4) where λ is a decreasing function with the number of auctions. A constant λ implies that when trading is continuous in a sequential auction, prices have constant volatility over time and therefore information is gradually incorporated into prices at a constant rate. All of the insider's information will be incorporated into prices at the end of trading as shown in equation (3.7). As the volatility of prices are determined by noise trading and not the informed trader, it is expected that trading volume of the informed trader is strategically small in order to maximise profit.

In summary, with regard to the relation among the presence of information asymmetry, price formation and market liquidity, Kyle (1985) formally shows in mathematical equilibrium that

- despite the presence of privately informed trader, the trader's private information would gradually be incorporated into prices eventually, and at the end of the trade all of his private information would be revealed,
- liquidity is a constant over time in a continuous auction for a given amount of prior inside information. Nevertheless, liquidity increases when the variance of uninformed order flow increases. It means that the market is more liquid when the level of uninformed traders is high, and
- the profit of an informed investor is an increasing function of the level of prior private information he has. It means if the informed investor has more inside information, his profit would be higher.

In essence Kyle (1985) shows that there is a linear relation between prices and order flow and there exists linear equilibrium. It is evident that even in a single auction trade, the model of price formation as a function of quantities traded is consistent with the model of price formation as a function of new information. Based on continuous multi-period auction, the Kyle's model is also consistent with semi-strong efficient market theory that in the long run all information would be incorporated into prices.

3.5.2 Extension of Kyle's model

An equilibrium in the Kyle model is characterized by the conditions that the price of the asset is equal to its expected value conditional on the information contained in the order flow, and that the informed trader chooses his quantity optimally as a function of his information, given the dependence of price on the observed order flow. The linear equilibria in Kyle's model are attractive because they are tractable and have been used as a versatile tool to analyse how changes in the environment affect financial market equilibrium under asymmetric information and the profit gained by privately informed investors (Noldeke and Troger, 2001).

As a result, many researchers have used and extended the Kyle model to develop other models. Variants of the Kyle's model have been used to analyse a variety of issues such as market liquidity and informational efficiency of prices, and to obtain implications for financial market regulation. For example, Holden and Subrahmanyam (1992) extend the Kyle's model to incorporate multiple privately informed investors. Using the same method and notation as in Kyle's model, Holden and Subrahmanyam (1992) derive the summarised liquidity equilibrium as follows,

$$\lambda_n = \frac{M\beta_n\Sigma_n}{\sigma_u^2} \quad (3.8)$$

where λ_n is the measure of market impact or liquidity, M is the number of privately informed investors, Σ_n is the variance of liquidation value, σ_u^2 is the variance of order flow of uninformed investor, β is a constant value, and n is the number of auction.

Holden and Subrahmanyam (1992) show that the informativeness of prices captured by conditional variance of liquidation value is derived as follows,

$$\Sigma_{n+1} = (1 - M\beta_{n+1}\lambda_{n+1}\Delta t_{n+1})\Sigma_n \quad (3.9)$$

where Δt_n is the time interval between the n th auction and the previous auction.

Essentially, Holden and Subrahmanyam (1992) conclude that in a unique linear equilibrium, informed traders trade very aggressively because they are competing with each other to trade. As a result, most of their private information is revealed very rapidly, even with just two informed traders, nearly all of their private information is incorporated

into price in the early trades. In the limit as the interval between multi-period auction approaches zero, all private information is revealed immediately at the first trade. Thus, the perfectly competitive outcome is a strong form of market efficiency, regardless of the number of auctions, when there is more than one informed trader.

From equation (3.8) to (3.9), it is observed that Holden and Subrahmanyam (1992) have extended the Kyle's model as the number of informed investors is now a factor contributing to equilibrium. As the number of informed investors M increases, price increasingly reveals all the new information. At the later auctions, price has revealed all new information, thus, trades do not reveal much information, as λ_t quickly approaches zero. It means that the market becomes more liquid at later auctions as price is becoming informationally efficient. As such, the market is less liquid in the earlier periods when there is severe adverse selection and becomes more liquid in later periods when most of the private information has already been revealed.

Results in Holden and Subrahmanyam (1992) are in contrast with Kyle (1985) in which Kyle finds that the single monopolistic privately informed trader causes his private information to be incorporated in prices gradually in multi-period auction and liquidity parameter is a constant rate. Its implication is that the informed investor maximises his expected profit at the end of the auction in Kyle's model, whereas in Holden and Subrahmanyam (1992), informed traders may not be able to maximise their profit as the informed traders have to compete to trade, thus, price quickly reveals the private information they have. Nevertheless, Holden and Subrahmanyam (1992)'s model is consistent with the empirical findings of Foster and Viswanathan (1990) where the trading costs and the variance of price changes are the highest and mostly prevalent on Monday than any other day in the week. High cost of trading and price variability on Monday could be explained by the arrival of new information during the weekends, leading to the presence of more informed traders on Monday than other days.

The effects of an increase in number of informed traders in Holden and Subrahmanyam (1992) compared with the Kyle's model could be summarised as follows:

- market liquidity is low at the beginning of auctions and started to increase towards the end of auctions, compared with monotonous pattern of market liquidity found

in the Kyle's model

- private information is incorporated into price at a faster rate, thus, price becomes informative quicker than the Kyle's model, and
- as a results, informed traders may not be able to maximise their profit from the private information they have, hence, their expected profit may be lower than that of the informed trader in the Kyle's model.

In other research, Spiegel and Subrahmanyam (1992) extend the Kyle's model where there are more than one informed investor, and both the informed and uninformed traders are rational, profit-maximizing agents with strategic, utility-maximizing hedgers. In other words, the uninformed investors are now no longer risk neutral but risk averse traders. Trading takes place at time 0 and the security is liquidated at time 1.

Spiegel and Subrahmanyam (1992) used the same method as in the Kyle's model and they find the following equilibrium,

$$\lambda = \sqrt{\frac{\Sigma_0}{N\sigma_w^2} \frac{M}{(M+1)^2\xi^2}} \quad (3.10)$$

where N is the number of uninformed investors, σ_w^2 is the variance of portfolio imbalance of uninformed investors, and ξ is the risk aversion of uninformed investors. All other notations follows from the previous model described earlier. The uninformed investors have an imbalance portfolio as the prices have changed or the arrival of new information or liquidity needs.

The variance of liquidation value v is given by,

$$\Sigma_1 = \frac{\Sigma_0}{(M+1)}. \quad (3.11)$$

Unlike the Kyle's model, however, the linear equilibrium of equation (3.10) and (3.11) exist only if there is a high risk aversion of uninformed traders, or a high dispersion of order flow from uninformed traders, or a high uncertainty about the liquidation value of v , or a sufficiently large number of uninformed traders and sufficiently small number of informed traders (Krause, 2000).

Consequently, linear equilibrium in Spiegel and Subrahmanyam (1992) does not produce similar results with the Kyle's model or an extension of the Kyle's model as in Holden and Subrahmanyam (1992) because the linear equilibrium can only hold with a condition mentioned earlier. For instance, in equilibrium in equation (3.11), the informativeness of price depends only on the number of informed traders. Furthermore, in equilibrium the impact on λ depends on the value of other parameters. Similar to Holden and Subrahmanyam (1992), competition among the informed investors resulted in the price revealing all private information in the earliest auctions. As the uninformed traders are highly risk averse, adverse selection cost is low when price has already incorporated private information. With low adverse selection cost, the uninformed investors are willing to trade with the informed investors when λ is low. Therefore, λ is low when the uninformed investors are highly risk averse and the number of uninformed traders is sufficiently high.

From equation (3.10), it is found that a high uncertainty regarding the liquidation value of v will increase adverse selection costs for uninformed traders, thus causing λ to increase as the uninformed traders are highly risk averse. However, if the uninformed trader is less risk averse, λ will not increase as the uninformed traders still have to balance the highly dispersed portfolio, thus liquidity still increases.

An increase in the number of informed traders can have two opposite impacts on λ . As the increase of informed traders causes the price to reveal nearly all private information, it will induce the highly risk averse uninformed traders to actively trade as adverse selection cost is low causing liquidity to rise. On the other hand, if the uninformed investors' risk aversion is low, their increase in trading cannot compensate the effect of competition among informed traders, hence, λ increases, causing liquidity to decrease. Thus, contrary to perception that an increase in informed traders will result in an increase in liquidity, Spiegel and Subrahmanyam (1992) argue that it does not hold for all cases.

In summary, when the uninformed traders are highly risk averse, having more uninformed traders or informed traders will not necessarily result in an increase in liquidity. If the number of uninformed traders are large enough and they are highly risk averse, on a condition that there is a sufficiently low number of privately informed traders, λ will

decrease, hence, liquidity increases. If the number of informed investors increases and the number of risk averse uninformed traders are small, competition to clear the trades between them increases, λ increases, thus liquidity decreases.

Equilibrium in equation (3.10) provides counterintuitive results that having more uninformed traders is not necessarily desirable from the point of view of market liquidity, i.e. additional risk-averse traders into the market can actually cause the market liquidity to decline. Spiegel and Subrahmanyam (1992) also extend the Kyle's model to incorporate whether the signals are identical or diverse. The main differences of findings between the models in Kyle (1985) and Spiegel and Subrahmanyam (1992) are shown in Figure 3.1.

Further extensions of the Kyle's model includes Yu (1999) who extends the multi-period model with a condition that the informed trader receives a noisy signal of uninformed trades. Yu (1999) shows that the value of the signal is positive when it has perfect precision, but can turn negative when it becomes less precise. Back and Cao (2000) study the competition among informed traders and explicitly describe the unique linear equilibrium when signals are imperfectly correlated. As in Holden and Subrahmanyam (1992), Back and Cao (2000) find that there is no linear equilibrium when signals are perfectly correlated. They also find that the market would have been more informationally efficient had there been a monopolist informed trader instead of competing informed traders.

Recently, Bommel (2003) uses the Kyle's model to examine the motivation to spread stock tips, where an informed investor with limited investment capacity spreads imprecise rumours to an audience of followers. In equilibrium, Bommel (2003) finds that rumours are informative and both rumourmongers and followers increase their profits at the expense of uninformed liquidity traders.

3.6 Information asymmetry and liquidity

Information asymmetry is closely related to liquidity. With the prevailing nature of information asymmetry, some investors have more information than others. It means that the more-informed investors have more advantage when they trade with the less-informed investors. If the less-informed traders know that there are more-informed traders in the

Conclusions of model	Kyle (1985)	Spiegel & Subrahmanyam (1992)
1. A linear equilibrium exists	Yes	Sometimes
2. Adding informed traders with identical signals increases market liquidity	Yes	Sometimes
3. Adding informed traders with diverse signals increases market liquidity	Sometimes	Sometimes
4. Adding uninformed traders increases market liquidity	Yes	Sometimes
5. Increasing the ex ante variability of the security's liquidation value decreases market liquidity	Yes	Sometimes
6. The informativeness of the price does not depend on the level of uninformed traders	Yes	Yes
7. The informativeness of the price increases in the number of informed traders	Yes	Yes
8. Adding uninformed traders increases the expected profits per informed trader	Yes	Sometimes
9. Adding informed traders with identical signals increases the welfare per uninformed trader	Yes	Never
10. Adding informed traders with diverse signals increases the welfare per uninformed trader	Sometimes	Never
11. Adding uninformed traders increases the welfare per uninformed trader	Yes	Sometimes

Figure 3.1: Differences of finding between models in Kyle(1985) and Spiegel & Subrahmanyam (1992)

source: Spiegel and Subrahmanyam (1992)

market, then there would be less trading as they know that they would be losing trading with the more-informed traders. Therefore, in general, stock is more liquid when there is less information asymmetry.

Previous research has demonstrated that information asymmetry translates into higher transaction costs for trading of shares, thus reduces liquidity. It is widely reported in empirical studies that liquidity measures such as trading volume and number of trades increase as information asymmetry declines (Bartov and Bodnar, 1996; Chakravarty et al.,

1998; Welker, 1995).

By its nature, Kyle (1985) notes that liquidity is a slippery and an elusive concept as it does not only cover transactional properties but also other properties. The properties of liquidity include tightness which refers to the cost of turning around a position over a short period of time; depth which refers to the size of an order flow innovation required to change prices; and resiliency which is the speed in which prices recover from a random, uninformative shock. Black (1972) describes that a liquid market is an informationally efficient market as well as a continuous market that traders can easily buy or sell any amount of shares immediately without any significant changes of price in the following trades.

Liquidity plays a crucial role in the financial markets. When the financial market is not liquid, there is no ask or bid prices for the asset. Without the availability of bid and ask prices, markets cease to exist and they are replaced by individualised bilateral contracts, as such, making it difficult for investors to trade. Thus, liquidity is necessary for the existence of any financial market. High liquidity expands the set of potential bid and ask prices and enhances the probability of finding a matching bid and ask price. Thus, a high liquid market reduces the risk of orders not being executed.

By providing more information from the company, investors would be better informed and there would be less investors who have private information, resulting in a reduced information asymmetry between managers and investors. Basically, the quality or precision of information contributes to a decrease in information asymmetry. A reduction of information asymmetry would reduce adverse selection among investors which would eventually lead to an increase in trading volume and liquidity (Blume et al., 1994; Kim and Verrecchia, 1997).

The importance of high trading volume which is related to liquidity is recognised in the financial markets. For example, some stock exchanges are engaging with others to form a bigger market size. In May 2007, the NASDAQ in the U.S. and OMX Nordic Exchange Group which includes Copenhagen, Helsinki, Iceland, Stockholm, Tallinn, Riga and Vilnius Stock Exchanges in Europe announced a proposed merger. The proposal will create the largest global network of exchanges and exchange customers linked by current

technology (World Federation of Exchanges, 2007). The merger is beneficial to increase trading volume and hence the liquidity of the market as the market is bigger and more investors can trade in the market.

It is evidence that liquidity is important at market or company level, either macro or micro level. Although the importance and concept of liquidity is easily understood, it is very difficult to define and estimate, hence, there is no consensus on definition and accurate measurement of liquidity. Liquidity may be defined best according to the function it serves. With regards to trading of individual security, liquidity is the ease with which it can be sold or bought without unduly affecting the price. For a corporate finance, liquidity is the ability to turn assets into cash to meet expected and unanticipated obligations or to create liabilities to raise funds. In a more general market sense, liquidity is the overall level of funds available for investing or trading (Moles and Terry, 1999, pg. 326).

For the stock exchange, high liquidity is associated with high trading volume which results in high income revenue due to trading fees. High income fees generated from high trading volume in the stock exchange will ensure the survival of the stock exchange. In order to survive and remain profitable, the stock exchange must be able to attract investors to trade in the exchange. Eventually, a highly liquid market generates more transactions, hence generates more revenues in the market. A highly liquid market would attract more investors to trade in the market, while a low liquid market is like an invisible barrier to investors, thus making it unattractive to market participants.

As for the company, liquidity is important in asset pricing. Amihud and Mendelson (1986a) show that liquidity affects price as the low liquid stocks with high transaction costs are traded at lower prices relative to their expected cash flows. At a company's operating level, liquidity ratio refers to cash flow which is one of the factors that affects corporate long term endurance (Chen and Lee, 1993). Similarly, in the operation of a banking system, liquidity is one of the variables included to determine the survival or failure in the banking system (Cole and Gunther, 1995). A bank failure could be contagious and severely affect other banks which is enough to lead to a total meltdown of the banking and financial system; hence, a sequence of government intervention is

necessary to prevent the system from collapse (Diamond and Rajan, 2005).

Other parties involved in the securities market will also benefit from a liquid market such as brokerage firms. Irvine (2000) documents that analysts' coverage will generate more trading volume for their brokerage firms. High trading volume means high commissions earned by the brokerage firms. The high liquidity in stocks covered by financial analysts provides an incentive to brokerage firms to send more analysts to cover more companies. The examples described above show that liquidity plays an important role in the market. Accordingly, it is evident that the authority in the stock market, investors and other market participants prefer a highly liquid market to a low liquid market.

The three characteristics of liquid market, i.e tightness, market depth, and resiliency are captured by Kyle (1985)'s model of price formation in a continuous multiple auction which is described in detail in Section 3.5.1. In the Kyle's model of continuous multiple auction, the market is infinitely tight, which means that it is costless to turn over a position very quickly as the auctions are held closely together. The Kyle's model also shows that the depth of the market is constant. Market depth is the ability to trade without any significant change in prices. It is not strategic for the informed trader to increase or decrease market depth, as it will have impact on his optimal profit. Finally, in the Kyle's continuous multiple auction model, market resiliency increases as it is near to the end of trading. Resiliency is the speed prices converge towards the underlying liquidation value. The Kyle's model shows that market resiliency is determined by the trading of the insider as noise trading can only move prices aimlessly.

3.6.1 Measure of liquidity

The literature regarding liquidity is so vast that we are not able to cover every single aspect. As there are many facets of liquidity, there are many ways to capture liquidity. For instance, Aitken and Comerton-Forde (2003) report that there are more than 60 ways to calculate liquidity.

For the research, we are interested in examining liquidity with regard to trading in the stock market. In terms of trading in the securities market, liquidity means the ease of trading a security. As liquidity changes over time, investors require compensation

for being exposed to liquidity risk, thus, liquidity has its impact on the required return by investors, corporations' cost of capital, hence the allocation of economic resources (Amihud and Mendelson, 1986b).

In general, liquidity measures mainly fall into two broad categories; trade-based and order-based. Examples of liquidity measures commonly used in the trade-based are trading volume, trading value, number of trades and turnover ratio. In general, trade-based measures are positively related with liquidity measures. It means that company with greater value reflects higher liquidity. Trade-based liquidity measures are widely used because most data are readily accessible and they are easy to operate. However, these liquidity measures are indicators of the past and not necessarily a good indicator explaining the future. For instance, a single day event might affect liquidity measurement such as a sudden jump in volume that pushes turnover ratio higher. It is obvious that trade-based liquidity measures fail to represent one aspect of liquidity which is the cost associated with immediate trading (Aitken and Comerton-Forde, 2003).

The second measure of liquidity is order-based oriented. An example of order-based liquidity measurement is the bid-ask spread, which measures the cost if investors want to trade immediately, especially in the market using a limit order book mechanism. In general, the bid-ask spread is negatively related to liquidity, which means that firms with high bid-ask spread are less liquid. However, since volume is not considered in the bid-ask spread, order-based liquidity measures might not represent the cost of trading of large volumes, especially when there is insufficient volume in the order book (Aitken and Comerton-Forde, 2003).

Besides liquidity measures either based on ease of a trade or cost of a trade, another finer measure of liquidity is inverse liquidity. In the Kyle's model reviewed in Section 3.5.1, inverse liquidity measure is represented by λ estimated from intraday trade and quote data. Brennan and Subrahmanyam (1996) estimate inverse liquidity, λ , by regressing the trade-by-trade price change on the signed transaction size. The slope coefficient from this regression is the Kyle's λ .

Despite the existence of many ways to estimate liquidity, there is still no perfect measure of liquidity due to the fact that there are many dimensions of liquidity that no

single measure can capture. In a typical study, it would be useful to use as many measures of liquidity as possible so that the results could be comparable and provide more insight.

3.6.2 Efficient market hypothesis

Although a single investor has a monopoly over the private information, Kyle (1985) shows in his continuous auction model that asset price will reveal all private information the monopoly investor has. Therefore, price formation as a function of quantities traded is still consistent with modelling of asset price as a consequence of new information. In other words, even though there is only one privately informed trader in the market, as long as the informed trader trades, gradually price will adjust accordingly to reveal all the information, hence the Kyle's model supports a semi-strong form of efficient market hypothesis. Furthermore, Holden and Subrahmanyam (1992) suggest that the outcome of a perfect competition between two or more investors that have private information is that a strong form of efficient market as described in Section 3.5.1.

A market is efficient when it efficiently adjusted new information into prices. It means that the prices of securities observed at any time are based on 'correct' evaluation of all information available at the time. In an efficient market, prices 'fully reflect' available information (Fama, 1976). Ultimately, in efficient capital markets hypothesis, prices convey all information available. The form of market efficiency could be divided into three categories according to what type of information has been taken into account in pricing. First is the weak-form efficiency where the information set includes only the history of prices or returns. Second is the semistrong-form efficiency where the information set includes all information known to all market participants or simply includes all publicly available information. Third is the strong-form efficiency where the information set includes all information known to any market participant or private information.

The underlying assumption of the efficient market hypothesis is that all the participants in the market have the same information and they all agree on the implication and distribution of future stock prices (Fama, 1976). A precondition for the efficient market hypothesis is that there is no trading cost or cost of information acquisition that would be reflected in the prices or the margin of getting benefit from reacting to information

that does not exceed the cost of acquiring the information, otherwise there will be no incentive to acquire information (Grossman and Stiglitz, 1980).

Kyle (1985) shows in his model that an investor who has a monopoly in private information could maximise his profit by trading in continuous auctions. However, if there is more than one investor who has private information, then Holden and Subrahmanyam (1992) argue that the market would become a strong-form of efficiency in the sense that the news spread very quickly and information is incorporated into prices without delay, and therefore their profit is smaller. As a result of an efficient market, Malkiel (2003) suggests no one is able to achieve greater returns than those that could be obtained by a randomly selected portfolio of individual stocks with comparable risks. He further argues that the term market ‘efficiency’ means that the markets do not allow investors to earn above-average returns without accepting above-average risks.

The idea that the market is efficient is very old and it can be traced back as early as 1900. For decades the idea that the market was informationally efficient was generally accepted among scholars (Campbell et al., 1997). Fama (1970)’s classic review of theory and empirical of the efficient market hypothesis produced a huge impact in the financial markets. He is the first to coin the term that the market is ‘efficient’ when the prices ‘fully reflect’ information.

Metcalf and Malkiel (1994) offer implication of the efficient market hypothesis. It means that no one could consistently beat the market unless he is willing to take more risks. Like any other theory, there are huge opponents and critics to the efficient market hypothesis. For example, Campbell and Yogo (2006) claim that the predictability of stock returns is now widely accepted by financial economists, and there is evidence of predictability, although now the evidence of predictability is more difficult to detect than previous studies have suggested.

In answering to critics of efficient market hypothesis, Malkiel (2003) admits that investors did make mistakes and some were irrational. As a result, pricing irregularities and predictable patterns always appear over time that could persist for short periods. However, he argues that the anomalous behaviour and the irrationalities of prices will disappear once investors have noticed and discovered the patterns. If the anomalous pat-

terns are predictable, then professional fund managers must be able to take advantage by producing consistently superior performance. However that is not the case. In order to prove the invalidity of market predictability hypothesis, Malkiel and Saha (2005) analysed the performance of all types of hedge funds in the U.S. from 1995 to 2003. They find that the hedge funds are riskier and the returns are lower than expected. So, the hedge fund managers are not able to consistently predict the future value of asset prices, otherwise they would be able to earn higher returns.

The model of price formation based on the efficient market hypothesis assumed that all investors have the same information and they all agree on the implication of the information on the distribution of future prices (Fama, 1976). By his own admission, although the assumptions are neither completely descriptive nor realistic, the assumptions are useful to simplify the real world phenomenon. Obviously, information asymmetry occurs in a real world situation and it simply does not fit in the assumptions.

Due to the prevalence of asymmetric information, assets pricing is not always perfectly efficient. Malkiel (1981) agrees that informed investors or insiders with private information will likely make profit on the information they have. However, on average, the market is efficient in incorporating all the information into the assets price. Besides, he argues that it is enormously difficult to translate known information into the estimate of true value of an asset. So, even if someone has private information does not mean he can consistently gain superior returns by taking advantage of the information.

Nevertheless, there is a lot of evidence in past studies showing that the market is not perfectly efficient and there exists an element of predictability in the market. For instance, investors who have insider information and trade in the information as early as possible before the news break in the market would have an advantage of earning positive excess return (Groth et al., 1979; Sanders and Zdanowicz, 1992; Womack, 1996). Even if the information is already known to the general public, there is evidence that it is still possible to take advantage from the information Anderson and Smith (2006); Barber and Loeffler (1993); Chan and Fong (1996)).

Therefore, Malkiel (1981) agrees that the assumptions in the efficient market hypothesis are fragile. Asymmetric information among investors is one of the phenomena that

can have impact on the market efficiency. It is because the asymmetric information among investors will provide differences in the estimation of future value between informed investors and uninformed investors. The differences in future value estimation clearly violate the assumption of the efficient market hypothesis. Despite the prevailing information asymmetry in the market, over the long run the market is informationally efficient thus the asset prices will reveal the new information and adjust accordingly (Fama, 1991; Malkiel, 1981).

3.7 Informational role of trading volume

In the literature of trading activities or trading volume, it is widely acknowledged that besides liquidity traders or uninformed traders who need to liquidate or re-balance their portfolios, the presence of huge differences and dispersions of prior expectations and beliefs among investors about the future value of asset prices create trading volume (Black, 1986; Kim and Verrecchia, 1991a). The positive association of trading volume and the arrival of new information is also widely covered in the literature (Kim and Verrecchia, 1997).

Trading volume data are regularly reported in the financial media along with price data. Unlike prices that have well-known asset pricing models, a well-developed theory of trading volume still does not exist yet. Time-series variation in trading volume and the relations of trading between volume, prices, and other economic quantities are still not fully understood (Lo and Wang, 2000). A better understanding of trading volume could be useful for at least three reasons. Firstly, it is widely assumed that investors are homogenous. Secondly, it is not clearly understood what information is reflected by volume data since the link between information and trading volume is ambiguous. Thirdly, the effects of institutional design of market on trading volume are not well understood as it is found that trading volume is lower in the imperfect or not properly organised market, and information has a persistent impact on volume in this market (Karpoff, 1986).

The pioneer and earliest study of linking information and trading volume is by Beaver

(1968) who suggests that trading volume does have an informational role, and not only a function to clear the market. Beaver (1968) defines information content as a change in expectations about the outcome of an event. He suggests that if an event has information content, the number of shares traded is likely to be higher than usual. The increased trading volume is due to a change in investors' assessments of the probability distribution of future returns, such that there is a change in equilibrium value of the current market price. Beaver (1968) adds another definition of information content which states that not only must there be a change in expectations but the change must be sufficiently large to induce a change in the decision maker's behaviour. So, an event does contain informational value only if it leads to an altering of the optimal holding of that company's stock in the portfolios of individual investors. On both occasions, investors will have to balance their portfolio, so trading volume has to increase.

According to Karpoff (1986)'s model of trading volume, there are two distinct ways new information can affect trading volume. Trades take place as agents or traders frequently revise their demand prices and randomly encounter potential trading partners. In his theory of trading volume, the arrival of new information would lead to an increase in trading volume. The informational event causes more trades as investors disagree about the meaning of information and revise their portfolios accordingly. The resulting reallocation of assets increases the expected volume of trade. However, an increase in trading volume does not necessarily imply disagreement of interpretation of information, as trading volume can also increase even if investors interpret the information identically. Karpoff argues that as long as investors have had divergence of prior expectations, new information will cause increased trading volume. On the other hand, Karpoff agrees that the expected trading volume can also decrease if the new information causes further divergence in the demand prices between shareholders and non shareholders. Therefore, the impact on trading volume upon the arrival of new information is still ambiguous and the direction is not very clear.

Other than Beaver (1968), several authors have also suggested theoretical models linking information content and trading volume, such as Huffman (1992) and Kim and Verrecchia (1991b). For example, Kim and Verrecchia (1991b) suggest that precise public

announcements cause investors to agree more about the assets value, which make investors' private valuations of the risky asset homogenous. Precise public announcements also increase each investor's confidence about his or her private valuation, thus investors become more willing to take speculative positions, thereby generating large trading volume. Therefore, public announcement is positively related with an increase in trading volume. Huffman (1992) finds that trading volume as well as prices can be highly correlated with a measure of information content. He shows in his model that even though the uninformed traders are not able to acquire perfect information by observing the equilibrium price, there will still be trading due to the fact that agents have differential information about future returns of the asset.

The linkage between information content and trading volume is supported by previous empirical studies. For example, Landsman and Maydew (2002) find no evidence of a decline in the information content of earnings announcements over the past three decades, as measured by both abnormal trading volume and return volatility around quarterly earnings announcements. Therefore, they suggest that there is an increase in the informativeness of quarterly earnings announcements over time as reflected by an increase in trading volume. Other empirical studies also support that there is informational content in trading volume (Alexander et al., 2004; Conrad and Niden, 1992).

However, Barron and Karpoff (2004) argue that in the actual market with positive transaction costs, the relation between information precision and trading volume is ambiguous and can be negative. Their model predicts that if transactions are costly, informative announcements will lead to homogenous valuations and strengthen investors' confidence in their valuation. Investors' belief also becomes homogenous causing their demand prices to converge. The potential gains from trade will be offset by the transaction costs. At the extreme, a very precise and informative announcement will generate very little trade because investors' valuations will converge. In general, when transactions are costly, the most precise and informative announcements will trigger the fewest trades.

This argument is supported by empirical studies of Bamber et al. (1997) who find that trading volume is negatively related to the convergence in analysts' forecasts around earnings releases. Barron (1995) also reports that trading volume is negatively related

to convergence in analysts' forecasts in general. These findings are inconsistent with the conventional notion that trading volume increases with information precision and the convergence of beliefs. Barron and Karpoff (2004)'s model reflects the presence of transaction costs that have impact on trading volume.

However, trading volume would increase if there is private information inferred at the time of an information release. This is predicted in the theoretical model of Kim and Verrecchia (1997). In their model, the pre-announcement information is considered private information gathered in anticipation of a public disclosure. This private information may lead investors to disagree about firm value and this disagreement is sufficiently material to stimulate trading. Barron et al. (2005) provide empirical evidence consistent with Kim and Verrecchia (1997)'s prediction that earnings announcements stimulate the development of private event-period information which spurs trading. In addition, Barron et al. (2005) argue that their results are also consistent with Holthausen and Verrecchia (1990)'s who suggest a theoretical model that decreases in consensus leading to increases in trading volume. This is because consensus declines when private information increases.

In summary, there are several reasons in the literature explaining the reasons for the increase in trading volume after learning about the new information. According to authors such as Beaver (1968) and Karpoff (1986), an increase in trading volume is due to the huge changes in expectations among investors after the release of new information. Meanwhile, according to Huffman (1992) and Kim and Verrecchia (1991b), homogenous valuations and confidence among investors cause them to trade more heavily. Holthausen and Verrecchia (1990) and Kim and Verrecchia (1997) argue that the disagreement about the firm's value is sufficient to create trading. However, Barron and Karpoff (2004) argue that trading volume reaction to an announcement is sensitive to the transaction costs, thus the relation between trading volume and information is ambiguous.

3.7.1 Volume-return relation

In another research strand, a theoretical model by Epps (1975) considers the relation of trading volume with price changes. Epps (1975) derives a model in which the ratio of trading volume to price change during upticks is greater than during downtick. It

implies that trading volume is relatively higher when the prices are moving up than when the prices are moving down. This is supported by Gervais et al. (2001) who present the visibility hypothesis in explaining the positive relation between volume and price. Gervais et al. (2001) argue that stock experiencing unusually high trading volume for a day or a week will tend to experience a high return the following month. The high-volume return premium is due to shocks in trader interest in a given stock which affects the subsequent demand and price for that stock. In another empirical study, Brailsford (1996) shows that the Australian market exhibits a positive relation between trading volume and price changes. Gallant et al. (1992) also find a positive correlation between volume and return volatility in the NYSE and large price movements are followed by large trading volume.

Llorente et al. (2002) construct a simple equilibrium model to analyse the dynamic volume-return relation. They argue that the relation of current return, volume and future return depends on the relative significance of speculative trade versus hedge trade. If speculative trading in a stock is relatively insignificant, returns accompanied by high volume tend to reverse themselves in the subsequent period. If speculative trading in a stock is significant, conditioned on high volume, returns become less likely to reverse and can even continue in the subsequent period. The difference in the relative importance of speculative trading among different stocks gives rise to the cross-sectional variation in their volume-return dynamics.

In other words, Llorente et al. (2002) argue that the amount of private information trading could be measured based on stock return autocorrelation conditional on trading volume. It is because stocks with a high degree of informed trading would exhibit greater return continuation on high-volume days, while stocks with a low degree of informed trading show higher return reversals on high volume day. They suggest that the amount of private information trading for each individual stock i is defined as the coefficient c_2 in the time-series regression as follows,

$$r_{i,t+1} = c_0 + c_1 r_{i,t} + c_2 r_{i,t} v_{i,t} + \varepsilon_{i,t+1} \quad (3.12)$$

where $r_{i,t}$ is stock return and $v_{i,t}$ is trading volume.

Llorente et al. (2002) argue that the estimated coefficient c_2 in Equation (3.12) increases as more information becomes available to insiders but is not shared with the

general public. c_2 is larger for companies that are more likely to have a higher degree of information asymmetry; that is companies with high bid-ask spread, small size companies and companies with lower analyst following.

This argument is supported by Gervais et al. (2001). They find that stocks experiencing unusually high (low) trading volume over a day or a week tend to appreciate (depreciate) over the course of the following month. They argue that this high-volume return premium is consistent with the idea that shocks in the trading activity of a stock affect its visibility, and in turn the subsequent demand and price for that stock.

Campbell et al. (1993) also investigate the relation between return dynamics and trading volume. They find that returns on high-volume days tend to reverse themselves. Unlike Llorente et al. (2002), in addition to risk sharing, Campbell et al. (1993)'s model does not recognise information asymmetry as an important motive to trade. Wang (1994)'s model of competitive stock trading is also consistent with Llorente et al. (2002)'s model. Wang (1994) find that trading volume is positively correlated with absolute changes in prices and dividends. He shows that informational trading and non-informational trading lead to different dynamic relations between trading volume and stock returns. Blume et al. (1994) examines the informational role of volume from the perspective of investors. In their model, investors can extract useful information from both volume and prices.

Consequently, theoretical and empirical studies are consistent that there is a positive relation between volume and return. However, the reason for the positive relation is not fully understood other than due to the privately informed trading or the market sentiment Baker and Stein (2004).

3.8 Summary

This chapter has reviewed the importance of information in determining prices. The Kyle's model is chosen as a basis of reference in examining the effects of an investor who has private information about the future value of a risky asset. In particular, the Kyle's model examines the relation between information asymmetry and prices. Basically, the Kyle's model managed to prove that in a continuous trade, prices are gradually

incorporating the private information and all the private information the trader has in his possession will be revealed at the end of trade. The insider who has the private information could maximise his profit by trading continuously at a smaller trade. The more amount of private information he has at the beginning of trade, the greater the profit he would be able to earn at the end of trades. Essentially, the Kyle's model is consistent with the efficient market hypothesis.

Furthermore, the Kyle's model shows that prices volatility is not affected as the market depth or market liquidity is at a constant rate during the trades. However, the results from the Kyle's model will be different when one variable is changed, for example, when there is more than one trader who has private information, or when the uninformed traders become more risk averse. This chapter has also provided the literature review on the relations among the amount of private information, the number of uninformed traders and informed traders, and the risk aversion of uninformed traders and their impact on market depth or informativeness of prices.

Finally, this chapter has also reviewed the relation between information asymmetry and market liquidity. The efficient market hypotheses and its relation with information asymmetry is also examined. Trading volume, which is associated with liquidity, and its relation with information is investigated. Theories in explaining reasons for an increase in trading volume and its relation with new information content is also investigated.

Chapter 4

The Role Of Financial Analysts

4.1 Introduction

In the previous chapter we have reviewed the pervasive nature of information asymmetry and theories relating to price formation under the presence of privately informed investors. The Kyle's model has provided a useful explanation of the strategic nature of the trading of informed investors. The extension of Kyle's model have provided the linkages among information, asset prices and trading activity. It appears in the literature that public announcement and the precision of information could reduce information asymmetry. In this chapter, we review the informational role of financial analysts as a marketing aid for the brokerage companies as well as a monitoring agent for investors. The incentives and behaviour of financial analysts as well as investor protections are reviewed. Past studies on the impact of analysts reports and recommendations and studies relating to the Malaysian stock market are also highlighted.

4.2 Financial analysts as marketing aid

It is evident that the market for information services is taking a variety of forms from the traditional ones such as newsletter, security analysis, fund management and investment advisory services to a new way of spreading news such as the Internet chatroom and e-mail messages. Timely information is important to investors in the financial markets

as a delay in receiving information may cost a fortune to investors.

Due to the difficulties for investors to search and acquire for more information about companies and the industries they are in, there is a demand for information intermediaries, such as the financial analysts. Financial analysts are investment professionals who are engaged in private information production to uncover managers superior information or the misuse of resources and then report it to the investors (Healy and Palepu, 2001). At the same time the analysts reports will have influence on investors opinion and expectations, and subsequently influence investors to trade (Karpoff, 1986).

Financial analysts usually work for the brokerage companies, which in the U.S. is widely known as sell-side analysts. In the stock market, a financial analyst is a person who produces reports on the companies he is covering, describing the nature and the state of the companies, expressing his opinion of the companies' potential, and finally suggesting recommendations of whether to buy, hold, or sell the shares of the companies. The company reports are usually distributed freely to the clients, while the public usually have to pay for the analysts reports. Financial analysts also cover or follow certain sectors in the industry.

In general, the analysts reports and their recommendations are capable of influencing stock prices and trading volume (Barber et al., 2001; Ryan and Taffler, 2006). An increase in analysts coverage and recommendations will likely generate more trading and commission earned in the brokerage companies. As the financial analysts coverage will always produce company reports and their recommendations, the information provided to investors or their clients will eventually lead to closing of a transaction.

Basically, the financial analysts role is to contribute in marketing of the brokerage company so that their clients will generate more trading with the brokerage company (Chung, 2000). For example, Irvine (2000) documents that trading volume done through the brokerage company is significantly higher in companies covered by financial analysts who are employed by the brokerage companies than companies that are not covered by the analysts. On average, brokerage companies increase their market share in the stock they covered by 3.8% relative to uncovered stocks. In this framework, the role of financial analysts is to provide information to their clients which will eventually lead to trading of

stocks. Essentially, it is to market the brokerage services.

4.3 Financial analysts as monitoring role

The reliance of the general public on the financial analysts reports is reasonably understood because financial analysts usually have to develop close relationships with the management of the companies they are covering, and because of that the analysts are assumed to know more about the companies than the general public (Healy and Palepu, 2003). In light of the disastrous financial scandal in U.S. companies such as Enron, Worldcom, Tyco, and many more Internet dot com companies in early year 2000, the profession of financial analysts was put under tremendous pressure and scrutiny. Financial analysts were partly blamed for their failure to detect earlier the dubious corporate reporting.

In this framework, the role of financial analysts is to act as monitors of management performance which is in contrast to the role of marketing aid to the brokerage companies. The monitoring role is reasonably understood since financial analysts usually have more access to company's information than the ordinary investors. It means that financial analysts could reduce the advantage of the informed investor or insider who has access to inside information. By providing the new information in the form of company's analyst report, financial analysts play a major role in making the capital markets move towards informational efficiency and helping prices become more revealing (Chung and Jo, 1996; Moyer et al., 1989). In other words, by producing companies reports, financial analysts help reduce information asymmetry between the managers and the shareholders so that new information can be quickly incorporated into prices (Doukas et al., 2005).

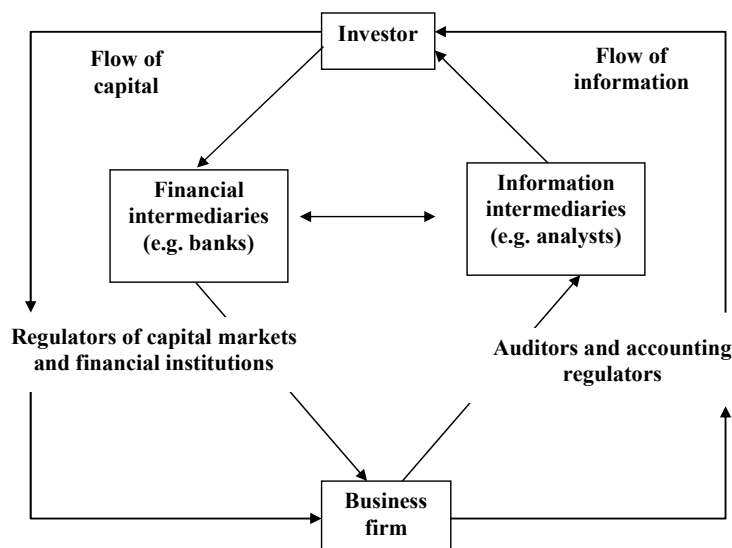
As the insider has more advantage over the private information he has, financial analysts role to provide information will be helpful to mitigate the advantage of the insiders. Corporate scandals that had occurred in the U.S. in early year 2000 revealed that financial analysts are equally guilty for not uncovering or disclosing corporate misbehaviour in its early stages (LeBaron, 2005).

We have shown earlier in Section 3.5.2 that from a theoretical point of view, competition among informed traders to make profit from the new information causes the

new information to be rapidly incorporated into stock prices at a quicker rate (Holden and Subrahmanyam, 1992). For example, Kim et al. (1997) document that analysts recommendations for initial coverage contain private information that on average, it takes five minutes for NYSE/AMEX stocks and 15 minutes for NASDAQ stocks to reflect the private information contained in these analyst recommendations. Therefore, the initial coverage of financial analysts help to monitor principal-agency problem whereby private information is quickly incorporated into prices.

The role of financial analysts as information providers who act to monitor business firms on behalf of investors as well as to market the brokerage services is depicted in Figure 4.1. It provides a schematic of the role of disclosure, information and financial intermediaries in the working of capital markets. The left-hand side of Figure 4.1 presents the flow of capital from investors to firms; which can flow directly from investors to firms, or indirectly through financial intermediaries such as the banks. The right-hand side of Figure 4.1 presents the flow of information from firms directly to investors through financial reports or press releases. Indirectly, firms can also communicate to investors through financial intermediaries such as financial analysts (Healy and Palepu, 2001).

Figure 4.1: Role of information in the capital market



source: Healy and Palepu (2001)

Investors usually prefer to have more information about the business firm before they can invest. On the other hand, the insider who has private information about the business firm would prefer to have a monopoly on the amount of private information in order to maximise his profit from the inside information he has (Kyle, 1985). Therefore, financial analysts who have access to the business firm would contribute in reducing information asymmetry by producing company's reports. By disclosing the information to other investors via the company's reports, the advantage of the insider would be reduced as the private information has been disseminated to other investors. As there are more investors being informed, the informativeness of prices is faster and prices are more efficient. This is consistent with the theoretical models we discussed earlier in Section 3.5. The role of financial analysts in reducing information asymmetry will result in the prices becoming more efficient, thus creating demand for the service of financial analysts.

4.4 Factors affecting financial analysts' performance

However, past events in the financial markets suggest that financial analysts are not able to perform their dual opposite roles perfectly well. For example, in the U.S. financial analysts failed to detect reporting discrepancies such as in the case of Enron (Healy and Palepu, 2003). In Asia, Ang and Ma (2001) find that financial analysts not only failed to anticipate the weaknesses in the companies they covered before the 1997/98 crisis, they also failed to sufficiently adjust their forecasts after these markets crashed. There are at least three factors that may hinder financial analysts to perfectly perform their dual roles as described below.

4.4.1 Conflict of interest

Since financial analysts are largely employed by the brokerage companies and brokerage companies earn commissions from trading of shares, financial analysts are more likely influenced to make favourable reports and recommendations, while the analysts earnings forecasts are inclined to be over-optimistic. Besides the trading commissions, it is due to the fact that the analysts are relying on the companies to provide them with information,

and in return the analysts issue favourable recommendations to win favour of the management and build good relations with the companies' personnel (Bradley et al., 2003; McNichols and O'Brien, 1997).

The favourable recommendations are plausible as studies on incentives note that analysts are rewarded for providing information that generates trading volume and consultation fees for their brokerage companies (Irvine, 2000). Another empirical research on evidence of conflict of interest is that analysts who have current banking relations with a company are more optimistic with their coverage than unaffiliated analysts. For example, Lin and McNichols (1998) report that analysts affiliated with lead investment banks issue significantly higher ratings on their stocks than unaffiliated analysts.

Conflict of interest arises because the brokerage companies earn commission for every service they provide to a company such as consultation or underwriting of shares, and therefore analysts tend to give more optimistic coverage. Conflict of interest may also occur when the analysts or the brokerage companies have direct or indirect interest in the company where the analysts are reporting. Therefore, the law requires the analysts and the brokerage companies to disclose their direct or indirect shareholdings in the company reported by the analysts.

As conflict of interest is inevitable, an efficient regulating body is essential to promote efficient, orderly and fair financial markets and to protect investors to achieve a fair deal. A fair market will not be achieved if financial analysts do not adhere to the practice code. Recently, in March 2007 the Financial Services Authority (FSA) of the U.K. had fined a financial analyst for failing to observe proper standards of market conduct. In that particular case, the analyst was found guilty of informing his client about a company in which he recommended to buy before the recommendation was published. It means that prior to its publication, the analysts had selectively disclosed to his clients details of his valuation methodology, final recommendation and the target price. In one case he also told a client the expected date of publication. His actions were clearly in breach of code of conduct (Financial Services Authority, 2007). Therefore, a continuous enforcement by the authority is important and crucial to monitor the market from exploitation.

4.4.2 Behavioural factors

The characteristic of the markets affects the operating of financial analysts. In the developed markets, for example, the sources of information are largely reliable and the public information already available to investors about the prospects of the industry is sufficiently precise. Therefore financial analysts have less incentives to produce reports on a specific industry. Since there is less information on a specific company, there are more incentives to produce information on the specific company. In other words, the investment value of providing additional information on the company is greater than the investment value of providing information on industry. On the other hand, in the emerging markets, there is a lack of information on the specific industry, and therefore financial analysts have more incentive to produce information on the specific industry than information on the specific company (Liu, 2004).

Besides the additional investment value, the incentive of providing information is also related to the potential revenues to be generated by the analysts. Brennan and Hughes (1991) report that the brokerage companies can generate higher income fees from the trading of low price stocks. This explains why there are more financial analysts providing coverage for such stocks. Essentially, financial analysts have more incentive to cover companies that attract investors' attention. In a more recent study, Jegadeesh et al. (2004) provide evidence that analysts concentrate their recommendations on stocks that have positive momentum, high growth and high volume.

The current global initiatives to encourage the governments and companies to disclose more information about their financial affair have also affected financial analysts activities. There are circumstances where greater transparency may be destabilizing rather than stabilizing as it may result in the provision of too much information that will actually increase volatility and precipitate destabilizing reactions (Ghysels and Cherkaoui, 2003; Morris and Shin, 2002). A theoretical model provided by Tong (2007) suggests that the initiatives which improve agents' access to public information may at the same time weaken market incentives to acquire the costly information from financial analysts. The crowding out of information means that there is less incentive for the analysts to produce information, and eventually the demand for financial analysts' services could be affected.

Despite the possible decrease in the demand for their services due to information over-crowded, the performance of financial analysts in the emerging markets have not improved either. Coen and Desfleurs (2004) find that the 1997/98 Asian crisis has not contributed to improve financial analysts' behaviour and their forecasts. As observed in the developed market, they suggest that financial analysts in the emerging markets are over-optimistic in their forecasts which casts doubts over their objectivity, independency, competency and rationality. This over-optimistic behaviour could be explained by the desire to stimulate the markets in making favourable forecasts for fear of falling into disrepute or the pressure of firms to keep optimistic forecasts.

Consequently, investors' reaction to information depend on the characteristic of financial analysts and the type of reports. In particular, the financial analysts' affiliation and the strength of the analysts' call play important roles. In other words, investors' reactions to financial analysts' research reports depend not only on the incentives of the analyst issuing the report but also on his conclusion about the stock (Eric Hirst et al., 1995).

Ideally, it is difficult to measure the independence of financial analysts. Although it is possible to structure a formal independence of financial analysts, the functional independence of financial analysts is difficult to achieve. For instance, although the reputation of financial analysts could be jeopardised by not producing precise information, Marnet (2005) suggests that the definition and interpretation of reputation are different between agents. Moreover, he argues that the potential return from being negligent might be substantially greater than the future benefits from being honest. Even if it is proven that there is negligence, in general the sanctions are of low visibility, hence ignored in the market.

Nevertheless, the performance and reputation of financial analysts could be protected by 'herding'. Herding is defined as 'excessive agreement' among analysts prediction (Graham, 1999). By herding, it means that the financial analyst's prediction is not significantly different from the others. Therefore, an increase in the number of analysts coverage does not result in a wider range of opinion about firms' earnings. Financial analysts are more likely to succumb to herding when their reputation is high, or their capability is low or the correlation of signal is strong. Herding occurs in order to safeguard analysts

reputation so that their status and level of pay are protected (Graham, 1999). In general, financial analysts are inclined to herding due to financial motivation incentive and the tendency to conform to consensus forecasts (Mensah and Yang, 2007).

Using analysts' recommendation as a starting point, Welch (2000) shows that the analysts' buy or sell recommendations have a significant positive influence on the recommendations of the next two analysts. Welch suggests analysts are inclined to herding when there is lack of information that they have to follow other analysts forecasts. Analysts' excessive optimism and overreaction bias in consensus forecasts are also seen in U.K. companies. The evidence also supports overoptimism, overreaction, and herding in analyst forecasts (De Bondt and Forbes, 1999). Besides lacking information, it is also discovered that herding behaviour among financial analysts increases with their difficulty to perform the task (Kim and Pantzalis, 2003).

As the existing structure of the financial market does not promote the independence of financial analysts, Krause (2003) suggests that the listed firms directly fund the research coverage, whilst the exchanges should monitor the practice of the appointed analysts. Alternatively, the cost of company research is partly covered by the company itself as is currently experimented at Bursa Malaysia (Bursa Malaysia, 2004) and Singapore Exchange (Singapore Exchange Ltd, 2007).

4.4.3 Prediction capability

It is not only that financial analysts are exposed to conflict of interest and biased reports, their capability to correctly predict company's earnings is also in question. For example, Malkiel (1981) and Fama (1991) are of the opinion that the capability of financial analysts to correctly predict future value of asset price is purely a random event, and that there are only very few fund managers who can persistently manage to earn returns higher than the market. Malkiel (1981) argues that it is difficult to predict the future value of company share prices based on the following reasons.

First, there are many factors that can have influence on prices and the influence of random events cannot be ruled out. Events such as government intervention, new laws and rulings or accidents at major plants are examples of random events that no one

can predict. Second, a company can project itself as a successful company through creative accounting procedure. Dubious reported earnings such as expenses deliberately not charged against earnings could be a misleading presentation of the current state of the company. Third, the incompetence of the analysts themselves makes the prediction difficult. Malkiel (1981) argues that many analysts simply follow the projection of earnings given by the company, or they just copy from other analysts. It is evident from the observed low returns among the hedge funds which did not match with the high risks taken by the portfolio managers. Malkiel (1981) also argues that many of the best analysts have gone to do sales or portfolio management, or are involved in the underwriting business which generates higher revenue to the analysts employer, instead of providing company's research reports.

In a similar spirit, Fama (1991) argues that since the market is efficient in reflecting new information into asset prices, the evidence of predictability of returns is controversial. In theory, it is possible to correctly predict the market using past data, but in the real world it is impossible to predict future asset prices ¹. Fama insists that the chances of getting abnormal returns are purely random events, and that nobody can guarantee that the abnormal return can be repeated over time again and again

However, in many empirical studies it is obvious that the analysts coverage and stocks they recommended have immediate impact on the share price. It shows that there is an opportunity for manipulation or insider trading before and even after the reports were produced. Previous literature has documented the capability of financial analysts to accurately predict company's forecast earnings for the next quarter (Branson and Guffey, 1998; Desai et al., 2000).

Previous empirical studies have also reported on the possible superior return for companies that were covered and recommended by the analysts (Desai et al., 2000; Ryan and Taffler, 2006). These authors suggest that financial analysts are capable of predicting forecasts earnings better than what people might think. Furthermore, it shows that even though the market is informationally efficient, it does not mean that the market is not

¹Interview with Eugene Fama, appeared at Investment Gurus, February 1997, accessible at www.dfaus.com

predictable.

However, as the capability of each financial analyst is different from one another, the company reports especially produced by the well-known analysts may be more influential than those produced by the least-known analysts. It is shown that if the investors follow the advice from the prominent financial analysts, they are more likely to gain superior performance in terms of abnormal returns (Cox and Kleiman, 2000; Sorescu and Subrahmanyam, 2006). It is also observed in empirical evidence that the accuracy of the financial analysts forecast is associated with their innate capability, industry specialization, analysts' firm specific experience, and brokerage affiliation, and not their job experience and the size of the bank that employed the analyst (Bolliger, 2004; Jacob et al., 1999).

4.5 Determinants of analysts coverage

As we have shown earlier in Figure 4.1, Healy and Palepu (2001) suggest that the flow of information is closely related to the flow of capital. Companies that regularly disclose information through promotion or other communication channels would be able to reduce information asymmetry among investors. Therefore, even though some companies do not get analysts coverage, they would be able to reduce information asymmetry among investors by disclosing information and promoting their companies more regularly, which would lead to an increase in the flow of capital.

Increasing of voluntary disclosure could have two opposite impacts on the demand of analyst coverage. As the company increases its disclosure, it means that there is more information available. Consequently, it helps to reduce the cost of information acquisition for the analysts, and create valuable new information to the analysts. Therefore, the analysts could provide more accurate earnings forecast and recommendations, and thus, the increasing of voluntary disclosure leads to higher demand for the service of financial analyst (Lang and Lundholm, 1993). On the other hand, greater disclosure from the companies means that investors do not really need analysts reports or their recommendations, resulting in a decline in demand for analysts coverage or analysts reports (Bhushan, 1989; Lang and Lundholm, 1993). As suggested by Blume et al. (1994), the

precision or the quality of information is important which will determine the impact on disclosure on analysts coverage demand.

Due to the prevalence of the financial market disaster in the U.S. in the year 2000, the SEC had introduced a new regulation pertaining to the disclosure of material information. The new regulation called Regulation Fair Disclosure (Regulation FD) has been effective since 23 October 2000. With the implementation of the Regulation FD, among others, companies are required to disclose promptly to the public the information that is disclosed to major shareholders, financial analysts or fund managers. In other words, the public must also be informed as soon as possible without delaying the information. The rules are designed to promote the full and fair disclosure of information by companies or issuers, and to clarify and enhance existing prohibitions against insider trading (U.S. Securities and Exchange Commission, 2007b).

The implementation of Regulation FD has a significant impact on the securities market. For example, Bailey et al. (2003) report that there is a significant increase in trading volume due to the difference in opinion among investors after the Regulation FD was enforced. Therefore, Regulation FD increases greater demand for services of investment professionals such as financial analysts, even though with more information being disclosed means that opinion amongst analysts would be more divided, resulting in greater forecast dispersion. In another study, Gintschel and Markov (2004) show that in the post-Regulation FD period the absolute price impact of information disseminated by financial analysts is 28% lower. It means that the adoption of Regulation FD has reduced the informativeness of analysts reports. Indirectly, it means that the adoption of Regulation FD could reduce the dependence on the service of financial analysts.

Despite the informational role financial analysts play in the capital market, social benefits of security analysis or analysts reports remain largely unexplored. The effectiveness of financial analysts as information intermediaries remained an open question (Healy and Palepu, 2001). Obviously, a decision to initiate analysts coverage or following of a company is a heavy financial commitment to the brokerage companies as it requires substantial resources from the brokerage companies. The brokers have to measure the benefit and costs involved when they decide which company they would like to cover. The

benefits include the expected commission revenue from trades and potential financing and consulting revenue obtained from the company they covered (Irvine, 2003).

In practice, the selection of companies under the financial analysts portfolios might be subject to certain objectives and constraints imposed by fund managers and brokerage firms. In general, there are three main reasons why analysts initiate coverage of a company. First, the analysts believe that he can generate trading in the security. It means that there must be a compelling reason for investors to believe that the current price is fairly below the fundamental value. Second, the initiating of coverage will occur when there is direction from a corporate finance department to do so. It means that the corporate finance department believes that the analyst coverage would lead to underwriting or consultation business. Third, the coverage will also occur when the brokers' clients have substantial holdings in the company. By covering the company, the analysts will provide service and support to the brokers' clients in the form of supplying them with information (Irvine, 2003).

Bhushan (1989) offers major determinants of the number of analysts that cover a company. Basically, he proposes a simple model of company's characteristics that are likely to influence the extent of analysts coverage which would either affect the demand for the analysts services or the supply of analysts coverage or both the demand and supply. The company's characteristics that determined analysts coverage are as follows:

- ownership structure of the company which is represented by the number of institutional shareholders, the proportion of institutional shareholding, and the proportion of insiders or management holdings,
- size of the company which is reflected by the market value of the company,
- return variability which is measured by the variance of return,
- number of lines of business which is an indication of business diversification, and
- correlation between company return and market return which is measured by the squared correlation coefficient, R^2 , between the company return and the market return.

Empirically, Bhushan (1989) finds that analysts following or coverage is an increasing function with all of the company's characteristics described above, except the proportion of insiders shareholdings and the number of lines of business. He finds that analysts following is a decreasing function with insider shareholdings such as employees, officers or directors of the company. This is because the demand for analysts service comes from the public and not the insider, and the demand increases as the fraction of the company shares held by insiders decreases. Furthermore, the cost of information acquisition increases with the level of insider shareholdings because of increased secrecy associated with insider shareholdings. Similarly, the greater lines of business would increase the cost of acquisition of information which would reduce the supply of analysts coverage.

The demand for analysts coverage increases as the number and the proportion of institutional shareholders increases. The supply of analysts coverage also increases if most of the transaction business of brokerage firms comes from institutional investors. The demand for analysts services is also increasing with the company size because of the increased benefits of private information from the analysts reports of larger companies. The supply of analysts services would also increase due to the higher potential business that larger companies bring to the analysts (Bhushan, 1989).

The activity of analysts coverage increases with the variance of return because the expected trading profits are higher for companies with higher return variability, with the condition that the cost of information acquisition is not increasing. Similarly, companies that have return highly correlated with the market return would have lower cost of information acquisition (Bhushan, 1989).

Among newly listed companies or IPOs, Rajan and Servaes (1997) found that the amount under-priced determined the number of the financial analysts coverage. Under-priced IPOs attract more financial analysts coverage as the analysts are over-optimist on the long-term prospect and growth of IPOs, and therefore analysts coverage is positively related to IPOs underpricing.

4.6 Financial analysts coverage and their recommendations

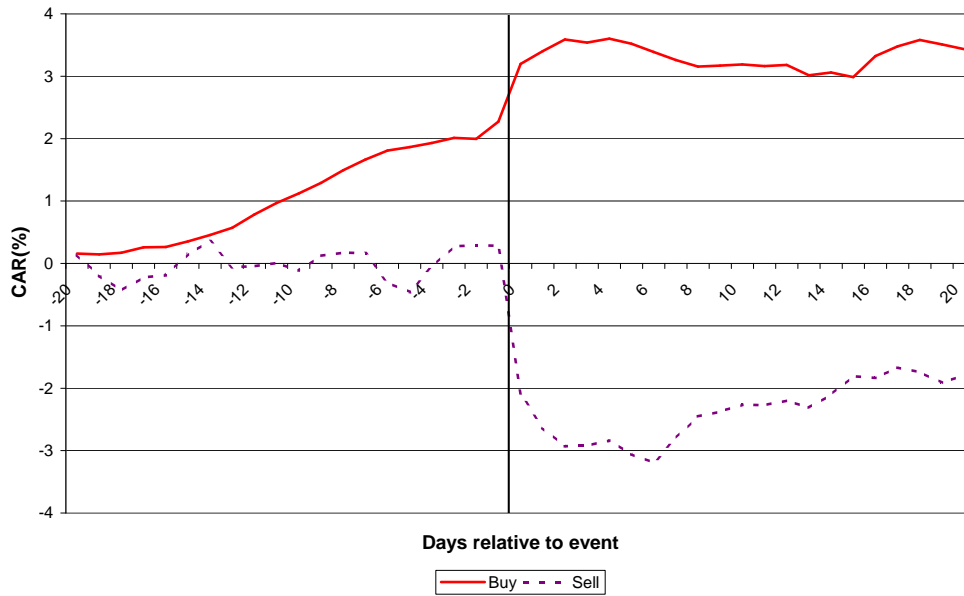
4.6.1 The impact on price and trading activities

Previous literature shows that certain announcements, news or events have an immediate impact on the value of a firm some time before and after they are released. Events such as the release of analysts recommendations, analyst earnings forecast or revision of analysts recommendations, press conference calls or merger announcements, are reported to affect the securities prices that have an economic value to the related firms (Barber and Loeffler, 1993; Brown et al., 2004; Ivkovic and Jegadeesh, 2004; Schipper and Thompson, 1985).

It is evident that to a certain extent analysts reports and their recommendations add value. Ivkovic and Jegadeesh (2004) suggest that the financial analysts forecasts and recommendations convey valuable information to the market. It could stem from the analysts capability to collect information independently and interpret public information better than the market does. In another study, Jegadeesh et al. (2004) report that the changes of analysts recommendation are more valuable and have more explanatory power than the absolute level of recommendation itself. It is due to the qualitative aspects such as the quality of companies management that could be captured in the changes of analysts recommendations. It is supported by Boni and Womack (2006) who suggest that the financial analysts capability to pick up stocks within their industry is substantial and economically significant.

An earlier study of the effects of financial analysts reports and their recommendations is by Davies and Canes (1978). They find evidence on the effects of secondary dissemination of analysts recommendations appearing in the Wall Street Journal (WSJ) after the recommendations were primarily disseminated to the analysts' clients. The evidence suggests that such secondary dissemination significantly affects stock prices and that the impact is not reversed within the subsequent 20 trading days. It means that analysts provide economically valuable information to clients, and that primary dissemination of such information does not always bring about a full stock-price adjustment.

Figure 4.2: Buy vs. sell recommendations - WSJ



source: Davies and Canes (1978)

As reflected in Figure 4.2, Davies and Canes (1978) show that companies with buy recommendations have most of the abnormal returns occurring before the publication of the recommendation and a relatively small movement of prices on the day of publication and several days after the publication. Companies that were recommended to sell, however, show no tendency for price movement before the publication and a much larger shift on the day of publication of analysts recommendation.

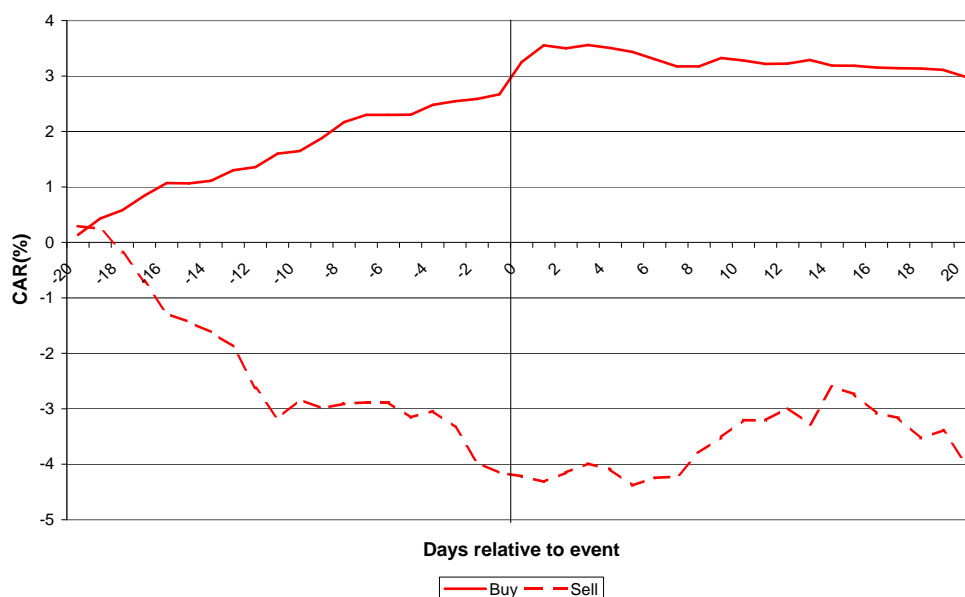
Liu et al. (1990) replicated a similar study and found similar results with Davies and Canes (1978). Liu et al. (1990) reported a significant cumulative abnormal return (CAR) of +3.09% for companies covered by the analysts over a three day period from two days before to the publication day of analysts recommendations on the WSJ, i.e. from day -2 to day 0. Trading volume is also more active than normal. A significantly higher trading volume is observed on the company covered by the analysts from day -2 to day 0 than those from day -5 to day -3 and from day +1 to day +3.

Another study in Hong Kong also gave similar results. Chan and Fong (1996) replicated a similar study based on analysts recommendations appearing on the Hong Kong Economic Journal (HKEJ), a popular Chinese newspaper in Hong Kong. Chan and Fong (1996) find a significant abnormal return of +1.8% on the publication day of buy recom-

mentations appearing on the HKEJ. Trading volume is also significantly higher on the day before, on the publication day and a day after the publication, i.e from day -1 to day +1.

Both the WSJ and HKEJ are domestic daily newspapers in the U.S. and Hong Kong respectively. The published analysts reports and recommendations are considered ‘second-hand’ because they have already been distributed to the analysts’ clients before they are published in the newspapers. The abnormal return and higher trading activities observed prior to the publication of analysts recommendations suggest that the publication of analysts reports provide the readers with information that has not yet been incorporated into prices even though the information is considered old news. It also means that the publication of analyst recommendations on the newspaper induces trading and investors could be able to gain an abnormal return by following the analysts advice.

Figure 4.3: Buy vs. sell recommendations - HKEJ



source: Chan and Fong (1996)

The movement of prices prior to and after the event mentioned above is consistent with the theoretical model detailed earlier in Section 3.5 that is if there is new information arising from the analysts coverage, then prices will adjust accordingly to reflect the new information. In other words, if no substantial price changes are observed, then the analysts coverage would not bring in any new information.

Investors could gain benefit from analyst coverage because previous studies indicate evidence that financial analysts add value in the capital market by contributing towards helping investors to make an informed decision. In other words, analysts coverage helps investors to make an informed decision about which company is to invest, and what is not. For example, Branson et al. (1995) report evidence on the superiority of analysts' quarterly earnings forecasts for small firms.

In another empirical study, Jaggi and Jain (1998) document that on overall basis analyst forecasts for Hong Kong firms are more accurate than the forecasts based on simple statistical model. The evidence suggest that the financial analysts forecasts are more accurate, presumably in part because they are able to incorporate more timely information on firm and economic news into their forecasts than time-series models. In other words, investors who follow analysts recommendations may be able to earn abnormal return from the increase in the company's value in the capital market.

Even though the analysts coverage is beneficial to investors that they would be able to earn an abnormal return by following the analysts advice, the superior return arising from the analysts coverage and their recommendations would soon be recognised by other investors. However, the market would take considerable time to recognise the existence of price anomaly. As discussed in Section 3.2, Merton (1987) suggests that the delay in prices adjustment could be explained by the hypothesis of investor recognition. In his hypothesis, he suggests that if positive or upgrade recommendations contain fundamental information, rather than just being advertisements, then analysts recommendations should increase the investor base for the stock, lower its cost of capital, and increase its stock price. The delay in the market to quickly react to analysts reports and their recommendations is due to a slower rate of diffusion of information among investors. As more investors have recognised the effects of analysts recommendations, the market reaction would be faster and the superior return will disappear at a quicker rate (Merton, 1987).

A higher trading activity around the release day of analysts recommendations as reported in Chan and Fong (1996) and Liu et al. (1990) could be explained by a theory suggested by Holden and Subrahmanyam (1992) previously described in Section 3.5.2. In their theory, Holden and Subrahmanyam argue that informed investors who have private

information trade heavily and compete with each other to exploit their information and maximise their profit. Their aggressive trades cause rapid revelations of their information, resulting in the prices revealing all the private information in the early trades. Similarly, investors who have superior information obtained from the analysts reports would trade more aggressively during a short period of time so that they could maximise their profit, and therefore a higher trading activity is observed. Alternatively, George et al. (1994) suggest that the increase in trading volume after the release of the analysts reports is because of lower adverse selection cost, and not because of increased informed trading. A lower adverse selection cost occurs when there is more information available due to the analysts coverage that have reduced the level of risk in stock trading.

The relationship of news or announcements of certain events and liquidity is well-documented in literatures such as in Chae (2005); Chakrabarti et al. (2005); Irvine (2003); Lamoureux and Poon (1987) and Sadka (2006). For example, Chae (2005) reports that trading volume is likely to increase if the announcements are not scheduled. Meanwhile, if the announcements are scheduled, trading volume is likely to decrease before the announcements are released. This is consistent with a theoretical model detailed in Section 3.7 that there would be an increase in trading volume if there is huge prior divergence of opinion amongst investors leading to the release of the announcements.

The analysts opinion and expectation reflect the differences in beliefs and interpretations among the analysts. This is reflected by the dispersion of earnings forecast among the analysts themselves. The dispersion indicates the degree of disagreement among them. From time to time, financial analysts revise the earning forecasts based on prevailing circumstances. The difference between current and prior forecast is a measure of belief or expectation revision. Belief revision or revision of expectation as discussed in Section 3.7 is an important element in stimulating trading. In other words, the analysts coverage generates higher trading volume if there are huge differences of expectations and belief prior to the analysts coverage. Therefore, the financial analysts coverage is influential in stimulating the needs to trade (Barron, 1995; Karpoff, 1986).

Besides the abnormal returns arising from the analysts coverage, higher trading volume is also beneficial to investors especially in the market that have no market makers like

the Malaysian stock market. The non-existence of market makers means that investors have to rely on the public flow of orders. Company that is traded heavily or has high trading volume means that there is very likely that the investors order would be executed, and hence there is low waiting time for the orders to be executed on the stock market. It means that there is less risk for investors holding inventory of the company shares. As discussed earlier in Section 3.6.1, trading volume is a proxy to measure liquidity and information asymmetry, and therefore the analysts coverage is beneficial to investors in increasing liquidity and reducing information asymmetry.

The analysts coverage is also beneficial from the company's point of view since there is evidence that analysts coverage is associated with an increase in valuation of a company. Excessive analyst coverage has the potential to cause an upward demand, leading to overvaluation of a company as it raises investors' optimism, causing share prices to trade above fundamental value. However, low analysts coverage stocks are more likely to influence the stock to trade below fundamental values as investors perceive the prevailing of asymmetric information in the stocks. Therefore, there is a possible link between excess analysts coverage and excess asset prices. Excess analysts coverage cause stocks to be traded at prices away from the fundamental value, which is detrimental to investors and market's ability to allocate capital efficiently (Doukas et al., 2005). Accordingly, while analysts coverage is beneficial to a company and investors as the analysts coverage increases the company's valuation, excessive analyst coverage is not.

In general, after receiving a buy recommendation a company usually experiences a higher abnormal return than a sell or hold recommendation. However, the magnitude of price and volume changes are different among the markets. For instance, Womack (1996) documents that in the U.S. market, buy recommendations experienced mean post-event drift of share price of +2.4% in the month of recommendation changes, and the post-event drift is short-lived. However, sell recommendations experienced a larger price drift of -9.1% within the first six months after the recommendations.

In another empirical study, Barber et al. (2001) find that a portfolio of stocks with strong buy recommendations provide an annual gross return of +4%, while a strong sell recommendations provide an annual gross return of -5%. Consequently, a strategy of

combined buying stocks that are most highly favourable and selling short stocks that are the least will yield an abnormal gross return of +0.75% a month. However, in terms of trading volume, there is no significant difference between companies recommended by the analysts. Nevertheless, trading volume for companies covered by the analysts are significantly higher than companies that are not covered by the analysts. It is another evidence that analysts recommendations are beneficial to investors where they can take cue from the analysts advise.

Likewise in the U.S. markets, financial analysts in the U.K. also have influences in the market. For example, Ryan and Taffler (2006) find that share prices in the U.K. are significantly influenced by analysts recommendation changes, not only at the time of the recommendation change but also in subsequent months. Abnormal return for buy recommendations is +2.06% in the month of the recommendation changes, and the equivalent average return for new sell recommendation changes is -3.3%. They also find that higher abnormal returns are generated in smaller companies. The significant abnormal positive return due to buy recommendations and abnormal negative return due to sell recommendations are an indication that the analysts in the U.K. are also capable of unveiling private information.

We have also discussed the theory in detail in Section 3.5.1 that if the investor has a monopoly over the amount of private information, then his profit is proportionate to the amount of his prior private information he has. Therefore, the magnitude of the abnormal profit or price changes after the release of analyst recommendations reflects the amount of prior private information the analysts have managed to reveal. Therefore, a higher magnitude of abnormal returns is associated with a greater amount of private information found in the analysts reports and their recommendations. In other words, the analysts recommendations are beneficial to investors because it helps to reduce private information. At the same time the uninformed investors could become informed investors upon receiving the information and they could also be able to make abnormal profit from the analysts reports and recommendations.

4.6.2 The impact on information asymmetry and liquidity

One of the advantages from analysts coverage is that the uninformed investor would become informed investors due to an increasing of information. From the theoretical point of view that has been outlined in Section 3.2, the presence of many well-informed investors make the prices informationally efficient and prices reveal all private information at a faster rate. This is consistent with the results of many empirical studies that a greater analysts following helps prices to rapidly incorporate new information than companies that are less covered by analysts (Kim et al., 1997; Moyer et al., 1989). Therefore, analysts coverage helps prices to incorporate new information quicker, thus reducing the risk faced by the uninformed traders when they trade because the prices are now more efficient.

The financial analysts coverage would lead to an increase in the amount of information as well as the quality or precision of information. As more quantity of information is available to investors and the quality or precision of information is improving, investors will be better informed and there would be less investors who have private information, resulting in a reduced information asymmetry among traders and investors. Therefore, a better quality or precision of information contributes to a reduced information asymmetry. Reducing information asymmetry would reduce adverse selection among investors which would eventually lead to an increase in trading volume and liquidity (Blume et al., 1994; Kim and Verrecchia, 1997).

Past empirical studies such as Brennan and Subrahmanyam (1995) and Roulstone (2003) report that the number of analysts that follow a particular company is positively associated with its liquidity. Controlling for the effects of trading volume, price level, and return volatility, Brennan and Subrahmanyam (1995) provide evidence that adverse selection costs reduce as the number of analysts following increase. Adverse selection cost is defined as the price impact of a marginal dollar trade. A low adverse selection cost means that the impact on prices is low for every trade, resulting in an increase in liquidity.

Brennan and Subrahmanyam (1995) admit that even though the number of analysts coverage is not a perfect proxy for the number of informed traders, the influence of financial analysts on market depth is still relevant. Admati and Pfleiderer (1988) provide

theoretical evidence that an increase in informed traders would lead to higher market liquidity. On the other hand, Holden and Subrahmanyam (1992) argue that an increase in the number of informed traders would increase market liquidity at the later trades after prices have already incorporated all private information as mentioned in Section 3.5.2.

Roulstone (2003) hypothesises that analysts provide public information, hence an increase in number of analysts coverage would result in increase in public information, thus reducing information asymmetry and forecast dispersion among investors. As a result, market liquidity increases as public information increases. Holden and Subrahmanyam (1992) suggest that the effect of increasing the number of informed traders is an increase in the information of order flow which reduces the adverse selection faced by the uninformed traders. This is because an increase in trades would reveal more information, prices become more revealing and thus increase the market depth or liquidity. Consequently, Roulstone (2003) suggests that regardless of whether the analysts following is a proxy for private or public information, an increase in analysts following would result in an increase in liquidity. High liquidity is beneficial to both the investors and the company, which we have described in detail in Section 3.6.

However, the effects of analysts coverage does not necessarily result in the increase in liquidity. We have described earlier in Section 3.5.2 that Spiegel and Subrahmanyam (1992) argue that other factors such as the number of uninformed and informed investors, the dispersion of order flow from uninformed traders, the uncertainty about the liquidation value of the risky asset and the risk aversion of uninformed investors will affect the liquidity.

This is supported by Chung et al. (1995) who suggest that market makers deduce the extent of the adverse selection problem by observing how many financial analysts are covering that stock. This is based on the belief that more financial analysts would cover a stock where there is a greater extent of information asymmetry since the value of private information increases with informational asymmetry. As the amount of prior private information reflects the profit of the insider, a greater number of analysts coverage means that there is greater private information. This is consistent with theoretical results in Kyle (1985) who suggests that the profit of an informed investor is proportionate to the

amount of private information he has. It means that there will be more analysts covering a stock when informational asymmetry or adverse selection cost is higher (Chung et al., 1995).

Nevertheless, as empirical studies are growing and discovered in the literature, there is more evidence in favour of the direction that analysts following is positively associated with market liquidity. Therefore, even though greater analysts following could be an indication of the presence of information asymmetry arising from the arrival of private information, the net effect of analysts coverage is still an increase in market liquidity (Vega, 2006).

In another recent study, Chang et al. (2006) found that the analysts coverage is positively associated with security issuance. In other words, companies covered by fewer analysts are less likely to issue equity. It is because the analyst coverage is negatively associated with information asymmetry, either because analysts reduce information asymmetry or because the analysts prefer to cover the transparent firms. Chang et al. (2006) argue that given the greater information asymmetry, companies that receive low analysts coverage issue equity less frequently as stock valuations are more likely to represent greater misvaluation.

4.7 The importance of analysts initial reports

As mentioned earlier, brokerage companies have to invest considerable resources to enable their financial analysts to produce companies reports and their respective recommendations. Analysts reports may be either ‘initiating’ or ‘continuing’. An initiating report is the first or initial analysts report on a given company. All other reports are continuing. An initiation coverage is the first company report which is usually a newly listed company or company that has no previous history of analysts coverage. According to Chan et al. (2006), an initiation of analysts coverage is more than a mere updating of clients. Rather, it is a clear and voluntary attempt by the broker to persuade investors to buy or sell a stock not previously covered by the analysts. Arguably, therefore, a brokers reputation is more likely to face a higher risk in an initiating recommendation than in a continuing

recommendation.

One of the roles of the analyst is to bring new information to the attention of investors. Therefore, the analysts first or initial report of the companies are potentially of special significance because they may include a greater quantum of new information than is likely to be found in a continuing recommendation (Branson and Guffey, 1998; Chan et al., 2006; Irvine, 2003).

Accordingly, the release of analysts initial reports or the initiation of a report is an important event. News on analysts initial reports are always shown in television financial news providers such as Bloomberg or CNBC as well as in other media channels such as daily newspaper or weekly newsletter. A wide coverage and publicity of analysts initial reports is an indication that the release of analysts initial reports is a significant event. As a result, more investors would be aware of the reports and they would become more informed as the news break. As there is more media coverage and reporting on the analysts initial reports, more information is disclosed to investors that would influence them to trade in the shares that were reported (Irvine, 2003; Kim et al., 1997).

Coverage from other media channels about the release of analysts initial reports also helps to induce investors to change their expectations and beliefs, which would lead investors to trade in the shares. If there is new information found in the analysts initial reports, investors would expect significant changes in the prices and volume traded (Denis et al., 2003; Easley and O'hara, 2004). Hence, the release of analysts initial reports should be an important and informative event.

Examining the effects of the release of analysts initial reports is a difficult thing to do, mainly due to the difficulty in getting hold of reliable data, particularly in determining which companies are covered by financial analysts and which ones are not. The difficulty arises from the fact that most of the company reports prepared by financial analysts are privately for the clients of the brokerage companies that published the reports. Therefore, many of the companies reports prepared by financial analysts are not for public consumption, hence it is difficult to determine whether the analysts reports are the first one for the company.

Previous studies usually used company reports for IPOs as a proxy to determine that

the reports are the first reports for the company. This approach was widely used such as in Boni and Womack (2006); Irvine (2003) and McNichols and O'Brien (1997). In the U.S. most IPOs are covered by financial analysts who work for the banks or brokerages companies that underwrite the IPOs. Analysts coverage for IPOs is therefore is part of services provided by the banks or brokerage companies, and subsequently there is always an initial report for a company. However, underwriting arrangement is different in between one country to another and therefore not all IPOs are covered by financial analysts. As such, it is not easy to find a first or initial analysts report.

Based on previous studies, there is always a positive abnormal return after the initial reports were released. For example, Peterson (1987) finds significant abnormal returns associated with the initiation of a security published in Value Line Investment Survey. Kim et al. (1997) find that significant positive abnormal returns occur on the event day ($t=0$) or at the open day of analysts initial buy recommendations with +4% for NYSE/AMEX stocks and +7% for NASDAQ stocks. Branson and Guffey (1998) also find significant abnormal returns of +3% associated with the release day ($t=0$) of the initial buy recommendations. Dhiensiri (2004) and Irvine (2003) also find that initiating analysts coverage improves liquidity greater than that of the continuing reports.

In order to examine the value of analysts coverage, Khorana et al. (2008) analyse the performance of companies that had lost analyst coverage. They provide empirical evidence that the loss of analysts coverage might be detrimental to the company. Analysts coverage provides news to investors which grab investors attention to react accordingly. Therefore, the lack of attention from investors causes the companies' value, such as earnings per share and book-to-market ratio, to deteriorate. It means that analysts are valuable because they provide better information than information from the public sources of information.

It is evident that the market interprets initiation of analysts coverage as a positive signal. This result is consistent with previous research emphasizing the positive externalities due to the reducing of information asymmetry from the release of the analysts initial reports. Brennan and Hughes (1991) and Brennan and Subrahmanyam (1995) suggest that an increase in analyst coverage improves liquidity because the analysts coverage

enhances competition between informed traders as more information is available, which will result in reducing the asymmetric information component of the bid-ask spread.

4.8 The importance of investor protections

The benefits of providing information to investors may not prevail if investors are not legally protected. A regulated market will protect investors from insiders' manipulation. For instance, company law can allow minority shareholders to detect managerial abuse by mandating information disclosure, and can help them to coordinate their actions and voice their discontent against the management and directors' abuses through voting and judicial venues (Pagano and Volpin, 2005).

The differences in legal protections of investors might help explain why companies are financed and owned so differently in different countries. The differences in the nature and effectiveness of financial system around the world reflect the legal rule and quality of enforcement of investor protections against expropriation by the companies. La Porta et al. (1998) find that the concentration of ownership of shares is negatively related to investor protections, consistent with the hypothesis that small, diversified shareholders are unlikely to be important in countries that fail to protect their rights.

La Porta et al. (1997) also find that countries with poor investor protections have smaller and narrower capital markets. A strong legal environment protects the potential financier against expropriation by the management because it raises the financiers' willingness to surrender funds in exchange for securities, and hence expands the scope of capital market. Chiyachantana et al. (2006) find that financial markets that have better shareholders' rights help to reduce the volatility spike of institutional trading in foreign stocks. It means that a stronger investor protections contributes to stabilizing the market.

Morck et al. (2000) argue that the synchronous stock price movements observed in the emerging markets is attributed to the lack of property rights protection. Political events and rumours in such countries could cause market-wide stock price swings. In a country that provides poor protection for public investors, problems such as inter-corporate

income shifting could make the practise of acquiring company-specific information less useful to risk arbitrageurs. As a result, stock markets in emerging economies may be less useful as processors of economic information than stock markets in advanced economies. Therefore, investor protections is equally important for the development of financial markets.

4.9 Summary

In this chapter we have reviewed and described the dual role of the financial analyst as a marketing aid for the brokerage company as well as a monitoring agent for the benefits of investors. By providing a reporting coverage of a company, financial analysts produce company's reports and recommendations which are useful in the financial markets. The content of the financial analysts reports would influence investors' opinion and expectation. Changes in investors' prior expectation and belief would encourage investors to trade, and therefore the financial analysts role is related to the marketing of the brokerage companies who are employing the analysts.

By having access to the analysts reports, the uninformed investors would become informed investors and they could make an informed decision. We have shown in this chapter that the information provided by financial analysts help the uninformed investors to become informed. In this context, the financial analysts role is to monitor the management of the company so that any new information will be unveiled and disclosed to the shareholder and the public as and when the news arrive. In other words, the financial analysts' contribution is to reduce the advantage of insiders who have access to private information so that they could take advantage from the information asymmetry. Therefore, this chapter has provided the link of the Kyle's model described earlier in the previous chapter with the role of financial analysts in disclosing information.

In spite of the inherent biased in the financial analysts forecasts and recommendations, in general the financial analysts coverage is useful in providing new information to uninformed investors and by having access to the analysts coverage reports and their recommendations, together with better investor protections and strong legal enforcement,

the financial analysts coverage gradually reduces the advantage of private information held by the insiders. Therefore, the financial analysts coverage would contribute to an increase in the efficiency of prices. The services provided by the financial analysts coverage is not only beneficial to investors but also to the companies covered by the analysts, the brokerage companies that employed the analysts as well as other market participants.

Chapter 5

Hypotheses Development and Research Design

5.1 Introduction

In the previous chapter we have described the dual role of financial analyst as a marketing agent for the brokerage company as well as a monitoring agent of the performance of company on behalf of investors in the effort of reducing information asymmetry. It is noted from the literature review that the current practise of the initiation of financial analysts coverage of a company is decided by the brokerage companies that are employing the financial analysts. However, the new arrangement of financial analysts research incentive scheme we described earlier in Section 2.6 is taking a different approach. Basically, companies that are participating in the incentive scheme are paying money in order for the analysts to cover the respective companies. Indeed, the incentive scheme is a new arrangement in the Malaysian stock market. The new arrangement of the incentive scheme is also a relatively new practise in any financial market.

It also appears from the literature review that most of the previous studies on the effects of financial analysts coverage examined the developed financial markets and that only a few studies had covered less developed markets such as the Malaysian stock market. This study therefore aims to fill the gap in the literature by examining the effects of a new natural setting provided by the implementation of the incentive scheme mentioned

earlier in Chapter 2. By studying the Malaysian stock market, this study also aims to contribute to the knowledge in a relatively less developed market.

In this chapter we describe the development of the research hypotheses that we are going to test based on the models we described in the earlier chapters. This chapter will also describe the approach we are going to implement in order to measure the effect of financial analysts coverage.

5.2 Hypotheses development

5.2.1 Background

The Malaysian stock market is one of the many emerging markets in the world that relies on a foreign investment portfolio, thus competition to attract them to invest as well as to retain them is stiff. In order to attract continuous investment, there should be sufficient information available to the investors about the companies listed on the stock market. Accordingly, the efforts and measures taken to promote the companies listed on each market are essential. By promoting the companies listed on the Malaysian stock market, there would be more information available to investors that would increase the companies' visibility and awareness among investors. Indirectly, the promotion of companies listed on Bursa Malaysia would attract more trading in the stock market, resulting towards a more liquid domestic market. As described earlier in Section 3.6 a liquid market is preferred to an illiquid market and deemed essential to attract both domestic and foreign fund to invest and continuously reinvest in the stock market.

We have also mentioned in Section 2.6 about the incentive scheme of financial analysts coverage implemented in the Malaysian stock market with the objective to promote companies. As discussed before, the incentive scheme is taking a different approach from the existing practise in order to increase the activities of financial analysts coverage, and therefore the main concern in the research is to discover whether the incentive scheme is beneficial to investors, the companies, the brokerage companies and other market participants. Particularly, this study is interested in investigating the effects of the release of analysts' initial reports of companies that are participating in the incentive scheme.

5.2.2 Research hypothesis

Earlier in Section 4.2 and 4.3 we have described the importance of financial analysts in promoting the company and monitoring the performance of the company they are covering, while in Section 4.7 we have discussed the importance of the financial analysts' initiation report in attracting the investors' attention. As the analysts' initial reports is an important document in initiation of a coverage, the release date of the initiation report is also an important event. We have also described earlier in Section 4.7 that due to its importance, the initiation of financial analysts' coverage should have a bigger impact than financial analysts' follow-up or continuing reports.

Consequently, the content of analysts' initial reports should be more accurate and should have more value than that of continuing recommendations in order to attract the investors' attention. It is because we have shown earlier in Section 3.5 that theoretically the investors' profit is proportionate to the amount of private information he got. In other words, if the analysts reports have new content or private information, then the first investor who reacts and takes position from the information would be able to maximise his profit.

We have also shown in Section 3.5 that when there is more than one informed investor, then the informed investors will compete with each other to trade aggressively in order to maximise their profit, resulting in price quickly revealing the new information. It means that if there is new information in the reports, then price would adjust to incorporate new information and abnormal return would be observed around the date of reports. Eventually, the analysts coverage contributes to prices quickly revealing new information which could be obtained from the analysts reports, and subsequently price would change substantially and immediately which would be accompanied by heavy trading activity.

We have described in Section 3.3 that the prevailing information asymmetry could increase adverse selection costs among investors. Information asymmetry also affects asset prices, cost of capital and valuation of a company. As discussed in Section 4.6, the financial analysts coverage could reduce information asymmetry which would reduce adverse selection among investors. This would eventually reduce the cost and risk of trading and increase the valuation of the company.

We have also mentioned earlier in Section 4.6 that the effects of analysts reports and recommendations could be measured on the day the reports were published as well as surrounding days around the published date. As a result, the financial analysts coverage would have effects on prices and trading activity. Effectively, we expect that the release of analysts report would induce a higher valuation and liquidity in companies covered by financial analysts than the companies that were not covered by the analysts. However, if investors were already aware of or have already anticipated the content of the analysts reports, then neither the analysts reports nor their recommendations have any significant effects on prices and trading activity.

By the same token, we expect that the analysts recommendation to buy would result in an increase in price. On the other hand, the analysts recommendation to sell would result in a price drop. If the analysts recommendations have influence on investors to revise their expectations and beliefs about the distribution of future asset return, then we expect that the analysts recommendations would trigger more trading activities than usual. However, we expect that a favourable recommendation would generate more trading activities than unfavourable recommendation, as we expect more investors would react to a favourable recommendation than an unfavourable one.

Based on the arguments outlined above which are obtained from previous theoretical and empirical studies, we develop the following null hypotheses:

Hypothesis 1. There are no significant differences of stock valuation, stock return, trading volume, liquidity and information asymmetry in the participating companies before and after the release of the financial analysts' reports.

Hypothesis 2. There are no significant differences of stock valuation, stock return, trading volume, liquidity and information asymmetry between companies that received favourable analysts' recommendation and companies that received less favourable analysts' recommendation.

Since the study also compares the performance of the participating companies with a control group matched by the type of industry, the following null hypothesis is going to

be tested:

Hypothesis 3. There are no significant differences of stock valuation, stock return, trading volume, liquidity and information asymmetry between the participating companies and the control group.

5.3 Research approach

5.3.1 Data sources

Data is sourced from the Bursa Malaysia website, personnel at Bursa Malaysia, and Datastream financial database. The list of the first batch of 100 companies taking part in the Bursa Malaysia analysts coverage scheme is retrieved from the stock exchange's website. Information on the dates of submission of the analysts reports and the analysts recommendations to the stock exchanges is also obtained from the website. Part of the price data series is obtained from personnel at Bursa Malaysia and another part is taken from Datastream covering the period from 1 May 2004 to 31 December 2005. The price data series contain daily data on the closing price, closing bid and ask prices, and volume traded for the companies.

Using 31 August 2005 as our cut-off date, we compile the date of the first submission of the analysts' initial reports to Bursa Malaysia. As the analysts' initial reports are immediately available online to the public via the stock exchange's website, we consider the submission date as the date of the release of the first analysts reports. It is observed that the release of the first analysts report is on 23 March 2005 and most of the companies reports are submitted in April 2005.

The study makes use of the availability of the financial database service by retrieving daily data from Datastream. The study uses daily data because it allows more precise measurement of abnormal returns, thus making it more informative in analysing the effects of an event on a daily basis. Examples of previous studies that had used daily data in examining the effect of the analysts recommendations in their analysis are Beltz

and Jennings (1997); Branson and Guffey (1998) and Desai et al. (2000). Previous studies, for example Barber and Loeffler (1993) and Barber et al. (2001), had also indicated that the effects on the analysts' recommendations could be detected by using short term daily data, and therefore the study is using daily data to analyse the effects of the release of the financial analysts' initial reports.

5.3.2 Data screening

We screen our data to make sure that there would be no discrepancies or errors in our data. The purpose of data screening is to verify that our data is correct and to reduce the effects of bias in our data. In running the data screening exercises, we check for errors or incompleteness in the price data series, new listings or initial public offers (IPOs), and thinly traded or illiquid stocks. We find that these are the most common sources of irregularities that will have an effect on parameter estimation and findings of the study.

Screening for data accuracy

The accuracy and completeness of data is very important in any study. Therefore we screen check the data for any errors or irregularities in our data series. Precaution is exercised by checking for any substantial daily price changes of more than 5%. Any daily movement of more than 5% will be treated with caution and are cross-checked with the respective share capital of a company. This is because substantial changes in daily prices is most probably due to the price data series that are not adjusted backwards when the company issued additional equity.

We discover that share prices lower than RM1.00 are truncated to two decimal places, and therefore the share prices that has been downloaded from Datastream are not accurate as we expected, hence, companies with share price lower than RM1.00 are excluded.

Screening for new listings and IPO

Previous literature have indicated that there is a huge price fluctuation amongst new listings or initial public offering (IPO) that it requires some time for the fluctuations

to ease off (Cheng et al., 2004; Ibbotson et al., 1988). This means that the market needs some time to evaluate the new listings and IPOs before the market force could decide the intrinsic value of the IPOs. Ritter (1991) outlines three anomalies commonly associated with IPOs of common stocks namely under-pricing, hot issue market, and long-run underperformance.

Due to the prevailing IPOs anomalies, by precluding new listings or IPOs in our analysis, we would avoid the effect of the huge price fluctuations that would result in biased estimations. Many past studies did not include new listings or IPOs in their samples. For example, in the study on the impact of analysts initiation of coverage, Irvine (2003) had removed new listings and IPOs from the sample of companies. Fama et al. (1969), in choosing sample companies that involved in stock split, also did not include security that was listed less than 12 months before the split. In the Malaysian stock market, Yong and Isa (2003) report the level of under-pricing in IPOs is different between types of new issues and between boards of listing.

Screening for illiquid stocks

The earlier screening exercises have eliminated 37 companies and only considered 55 companies out of 92 analysts reports that were submitted as at end of August 2005. Lastly, we screen companies that are infrequently traded during the period under study. Thin trading or infrequently traded stocks is another source of error in parameter estimation. The implicit assumption in the asset pricing model is that the share prices are continuously observable. However, in reality many shares are not traded daily, while some are not traded for days, hence their daily returns are not observed. So when proxies are used to measure the unobservable returns in thinly traded stocks, errors in variables are inevitable (Scholes and Williams, 1977).

The presence of illiquid stocks or non-synchronous trading may partially explain autocorrelation of portfolio returns (Kadlec and Patterson, 1999), thus violate the assumption of the classical linear regression model. Brown and Warner (1985) argue that for the hypothesis test over intervals of more than a day, the failure to take into account autocorrelation in estimating the variance of the cumulative mean excess return could result

in misspecification. Nevertheless, Campbell et al. (1997) have shown that the presence of non-trading does not affect the mean value of observed returns of individual security, although it does increase their variance if the security has a non-zero expected return. They have also shown that there is little empirical evidence to support that non-synchronous or non-trading is an important source of autocorrelation in stock returns.

In the study, we find that most of the 55 sample companies that have passed the screening exercise were fairly and frequently traded during the period under study with a mean ratio of non-trading day of 0.10. The highest ratio of non-trading days among the 55 companies is 0.33. The non-trading day ratio is basically the ratio of the number of non-trading days for a particular stock to the number of all trading days. We also find that the ratio of non-trading day in the control group is relatively low, and therefore no company was eliminated due to the problem of severe non-trading day.

Nevertheless, we follow Scholes and Williams (1977) (SW) who propose a consistent estimators of intercept and slope, $\hat{\alpha}_i$ and $\hat{\beta}_i$ respectively, in order to deal with the presence of thin trading or illiquid stocks. In particular, the adjusted parameter estimate, $\hat{\alpha}_i$, is defined as follows,

$$\hat{\alpha}_i = \frac{1}{T-1} \sum_t r_{i,t} - \hat{\beta}_i^{SW} \frac{1}{T-1} \sum_t r_{m,t} \quad (5.1)$$

where $r_{i,t}$ is the return on company i for day t and $r_{m,t}$ is the market return for day t , $\hat{\alpha}_i$ is estimated over estimation period T . Meanwhile beta is estimated as follows,

$$\hat{\beta}_i^{SW} = \frac{\hat{\beta}_i^+ + \hat{\beta}_i^0 + \hat{\beta}_i^-}{1 + 2\hat{p}_m} \quad (5.2)$$

where \hat{p}_m is the first-order autocorrelation of the market index return. $\hat{\beta}_i^+$, $\hat{\beta}_i^0$ and $\hat{\beta}_i^-$ are the ordinary least square (OLS) estimates of the slopes of regression of company i 's returns on one-period lag, concurrent, and one-period ahead of the market index which are obtained from the following models,

$$r_{i,t} = \hat{\alpha}_i^+ + \hat{\beta}_i^+ r_{m,t+1} + v_{i,t}, \quad (5.3)$$

$$r_{i,t} = \hat{\alpha}_i^0 + \hat{\beta}_i^0 r_{m,t} + \nu_{i,t}, \quad (5.4)$$

$$r_{i,t} = \hat{\alpha}_i^- + \hat{\beta}_i^- r_{m,t-1} + \omega_{i,t}. \quad (5.5)$$

Despite the widely-used of SW approach in the literature, Clare et al. (2002) suggest that it is not entirely free of drawbacks. Although the SW approach is capable of removing the bias from estimated betas, the variance of estimator is large, resulting in imprecise coefficients. The relative performance of the SW approach when compared to OLS beta estimates is somewhat inconclusive (Fowler et al., 1989). They find that the SW beta is less biased, but more inefficient, than those generated by OLS. On the other hand, Bartholdy and Riding (1994), who study daily data from New Zealand, conclude that OLS betas are less biased, more efficient and as consistent when compared to the SW estimators. The results of the SW approach used in the study is presented in Section 6.6.1.

5.3.3 Measurements

The effects of a surprise news announcement by a company or new information are measured by their impact on trading behaviour. If the news is a huge surprise, trading behaviour is expected to be different (Bhattacharya et al., 2000). The more surprising the news is, the bigger the trading pattern would depart from the normal trading behaviour. The purpose of the study is to examine the effect of the release of the financial analysts' initial reports on the variables mentioned in the following section, and like Bhattacharya et al. (2000), the study is interested in examining if there is any abnormal behaviour in any of the following variables.

Stock valuation

Stock valuation measures the fair value of the company which could be measured using the accounting-based approach or if the company's shares are listed in the stock market, the quoted price is used to measure the company's fair value. In the event that there is any party who would like to acquire the company, stock valuation could be used to determine the price. In Section 3.4.1, we have discussed several variables used to measure investment-related proxies. For a company that is listed on an exchange, one can easily value a company through the stock prices, and therefore a high stock valuation is beneficial to the shareholders. In the research we used stock market valuation to value the stock.

Stock market valuation is basically the share prices multiplied by the number of unit shares listed. We use a log value of the stock market valuation instead of raw market valuation as the distribution of log normal would be closer to normal (Fama et al., 1969).

Stock return

In Section 3.4 we have discussed the usefulness of using stock prices to measure the impact of information asymmetry. It has been extensively covered in the finance literature that stock return or changes in stock prices gives direct evidence of the arrival of new information or the presence of traders with private information (Fama et al., 1969; Kyle, 1985). Stock return is calculated as follows,

$$r_t = \log\left(\frac{P_t}{P_{t-1}}\right) \quad (5.6)$$

where P_t denotes the stock price at date t . r_t is also known as continuously compounded return or log return r_t . Stock return measures the performance of the company's share price over a certain period of time, thus it measures investment opportunity during a specified time horizon, regardless of the magnitude of the investment. Essentially, stock return is used to measure the return of investment where a positive high return indicates that the investment is profitable.

Trading volume

In Section 3.7 we have mentioned the positive relation between trading volume and the arrival of new information. Moreover, Pagano (1989) asserts that high trading activity contributes to high liquidity in the market, and therefore, trading volume is positively associated with liquidity. As liquidity is related to the rate of return and inventory cost, investors could not ignore the importance of liquidity factor in their investment.

In this study, trading volume is measured by turnover which is the raw trading volume divided by the number of outstanding shares. The using of turnover instead of raw trading volume is to reduce the independence on company size since the big companies are usually traded heavier on the stock market than smaller companies. Stock turnover

is calculated as follows:

$$Turnover_t = \frac{VOL_t}{Shares_t}. \quad (5.7)$$

Bid-ask spread

We have discussed in Section 3.4 that it is not possible to directly observe information asymmetry. Stoll (1989) suggests that the component of bid-ask spread could be divided into three parts, such that 47% is made of order processing costs, 43% adverse information costs, and 10% inventory holding costs. So, the bid-ask spread could be used as proxy to capture some aspect of information asymmetry that is the adverse information cost. As a whole entity, the bid-ask spread measures the implicit cost of trading.

There are a few ways to calculate the bid-ask spread. Due to a limitation of available data, following Bhattacharya et al. (2000), the bid-ask spread is calculated as following:

$$SPR_{i,t} = \frac{A_{i,t} - B_{i,t}}{M_{i,t}}, \quad (5.8)$$

where $A_{i,t}$ is the closing ask price, $B_{i,t}$ is the closing bid price, and $M_{i,t}$ is the middle price of the closing bid and ask prices. Calculation of bid-ask spread using equation (5.8) is easier to operate than using other measures because we only have the adjusted price in our data, whereas in other calculations of bid-ask spread, it needs the actual price, and not the adjusted price.

Measure of illiquidity

As we have described in Section 3.6, liquidity is important in any market. Without sufficient liquidity, the market could collapse and be defunct. With regard to the stock market, liquidity is important for the market participants as it reflects the asset's ability to be easily converted through buying and selling without causing a significant movement in the price and with minimum loss of value. Furthermore, there are many dimensions of liquidity that we are unable to capture each and every aspect due to limited data.

In the research, the dimension of the ease of trading in liquidity measure is captured using the trading volume or stock turnover. A high trading volume or stock turnover means the stock is easily traded on any trading day. Trading volume is the raw trading

volume, while stock turnover is trading volume divided by the number of shares outstanding. The advantage of using stock turnover is that it reduces the dependence of company's size. Big company usually has more shares listed for trading, while a small company usually has less shares listed for trading, and therefore, we used share turnover instead of raw trading volume in order to avoid the dependence of company size.

The bid-ask spread could also be used as a proxy to measure liquidity as it also captures the dimension of the ease of trading. A low bid-ask spread means the stock is highly liquid as it reflects the differences of prices between the potential buyer and seller. Therefore, in the research, trading volume and bid-ask spread could be used to measure liquidity.

Alternatively, liquidity could be measured from the opposite direction, i.e. the measure of illiquidity. From Section 3.5.1, Kyle (1985) shows that $\frac{1}{\lambda}$ from Equation (3.2) measures the depth of the market which is the net order flow needed to induce price change. The market depth measure is proportional to a ratio of the amount of noise trading to the amount of informed trading. In essence, λ measures the level of information asymmetry in a particular stock, and therefore λ measures market illiquidity that is a result from information asymmetry. Measures of illiquidity are employed in studies such as Amihud and Mendelson (1986a) and Berkman and Eleswarapu (1998) who find a significant positive effect of quoted bidask spreads on stock returns. Brennan and Subrahmanyam (1996) measure stock illiquidity as the price response to signed order flow (order size), and by the fixed cost of trading, using intra-day continuous data on transactions and quotes. They found that these measures of illiquidity positively affect the required rate of returns.

Empirically, in order to compute a price impact we need to have detailed transaction data, that is the sequence of bid and ask prices. Lee and Ready (1991) develop an algorithm to classify whether the trade is buy-initiated or sell-initiated. In other words, the algorithm is to match each transaction price to the most recently reported quote prior to the transaction.

Due to the data constraint, we follow Amihud (2002)'s method to calculate the inverse price impact, λ , based on the Kyle model described in Section 3.5.1. The proxy for λ is

calculated as follows,

$$\lambda_a = \frac{|r|}{VOL} \quad (5.9)$$

where r is daily return and VOL is the number of shares traded. Intuitively, λ_a reflects the relative price change that is induced by a given volume. A big λ_a shows that trading volume is small relative to returns, while a small λ_a means that trading volume is big relative to returns. Basically, λ_a as suggested by Amihud (2002) measures stock illiquidity where big λ_a numbers reflect that the stock is highly illiquid, while small λ_a number means that the stock is highly liquid.

As the measure of λ_a is sensitive to company size, we proposed another measure of λ as follows,

$$\lambda_b = \frac{|r|}{\frac{VOL}{Share}} \quad (5.10)$$

where $Share$ is the outstanding units of shares. Effectively, our proposed λ_b measures stock returns over share turnover, which essentially removes the dependence on company size to measure the price impact. Similar with λ_a , a high λ_b means the stock is highly illiquid, while a low λ_b means the stock is highly liquid.

Measure of private information trading

We have also shown in Section 3.7 that there is dynamic volume-return relation with information asymmetry. In that section, Llorente et al. (2002) argue that the amount of private information trading could be measured based on stock return autocorrelation conditional on trading volume. We follow Llorente et al. (2002) who suggest that the amount of private information trading in stock i is defined as the coefficient c_2 in the time-series regression as follows,

$$r_{i,t+1} = c_0 + c_1 r_{i,t} + c_2 r_{i,t} V_{i,t} + \varepsilon_{i,t+1}. \quad (5.11)$$

where $r_{i,t}$ is stock return, $V_{i,t}$ is trading volume and $\varepsilon_{i,t}$ is the error term.

Llorente et al. (2002) argue that the estimated coefficient, c_2 , in Equation (5.11) increases as more information becomes available to insiders but is not shared with the general public. Effectively, c_2 is positive and larger for companies that are more likely to have a higher degree of information asymmetry.

5.3.4 Control group

A control group is a group of subjects or samples who are used as a basis for comparison so that it could assess the effect of program activities on participants who are receiving the services, products, or activities that are being evaluated. In order to make the comparison valid, the composition of the control group should resemble that of the treatment group as closely as possible. The using of control group is extensively used in a scientific experiment such as treatment of medicine. Control group is also used in the area of finance research. For example, Bollen (1998) compares changes in the return variance of optioned stocks to changes in the return variance of a control group. The control group is matched by industry type and location of trading of securities.

In order to assess whether a company is performing good or bad, we must specify a benchmark against which sample companies can be compared. In general, sample companies are compared to companies with the same industry, size or valuation ratio. This method of comparison implicitly assumes that the performance of companies varies by industry, firm size or valuation ratio (Barber and Lyon, 1996). However, the using of market index as a control portfolio is misspecified, i.e. the empirical rejection rates exceed theoretical rejection rates, which means that the test statistics using the market index as a control is biased. There are three sources of biased, namely, new listing biased which is due to the inclusion of new components that constitute the market index; rebalancing biased which is due to rearrangement of the components of market index; and the skewness biased of abnormal return (Barber and Lyon, 1997). Therefore, the using of matching samples firms by similar characteristics such as sizes or industry corrects the biased and yields well-specified test statistics.

In our study, the control group is made up of companies that are not involved in the analysts coverage scheme. However, it is also possible that companies that are not participating in the incentive scheme are actually covered by financial analysts. As we have described earlier in Section 4.7, companies reports prepared by the analysts are usually for clients of brokerage companies, and not freely available to the public. Due to the difficulty of precisely identifying which company has analysts following and which company has not, our basis of choosing the sample of control group is simply based on

the fact that the company do not participate in the analysts coverage scheme.

Similar to the approach taken by Bollen (1998) and Barber and Lyon (1997), we construct the control group by the matching of industry. The identification of the company's industry type is based on the listing sector on Bursa Malaysia. In essence, the testing of significance will be such that if the control group exhibits an average stock return that equals the average stock return in the group participating in the analysts coverage scheme, then we can conclude that the analysts coverage scheme does not, on average, affect stock return.

We use Datastream to download prices data. We examine the website of the Malaysian stock market to find out the company's number of outstanding shares. We apply the same criteria mentioned in Section 5.3.2 to screen out companies that will be selected in the control group. Basically, we eliminate companies that are traded below the price of RM1.00 and companies that are listed for less than a year from 18 April 2005. This is the date when most of the companies have had their analysts' initial reports released. We manage to find a total of 50 companies that will be included in the control group.

Unfortunately, we are not able to obtain the exact match of companies in the control group with the ones in the participating group in terms of size and industry classification. This is because many companies are traded below RM1.00. As we have mentioned before, stock traded below RM1.00 are not included because the downloaded data series are not accurate. Besides, many of the small and medium companies are participating in the incentive scheme and therefore there are less small companies left to choose from. Eventually, the component of control group is made up of many big companies.

Ideally, the control group should have a similar company size with the participating group. It has been widely reported in previous studies that company size is closely associated with returns, trading volume, bid-ask spread and liquidity (Arnold et al., 2007; Chen and Lee, 1993; Hameed and Ting, 2000). A small company is usually associated with high returns, low trading volume, high bid-ask spread and low liquidity, while a big company usually has the opposite attributes. Therefore, the comparison with the control group might pose a problem due the difference in characteristics between the big and small companies.

Despite the difference in terms of company size between the participating companies and the control group, most of the companies in the participating group are matched in terms of industry classification with the control group. Moreover, we will show in the next chapter that the empirical results are still comparable between the participating and control group.

5.4 Method of analysis

5.4.1 Comparing of means

As there are two groups of companies, i.e. companies participating in the incentive scheme and companies in the control group, data is divided into two groups of companies. Daily data series is then divided into three sub-periods. The first sub-period is 120 trading days before the analysts' initial reports were submitted, the second sub-period is the event day itself, and the third sub-period is 120 trading days after the reports were released. By dividing the data into groups and sub-periods, we are able to measure the effects of analysts reports between different groups by comparing means of variables between groups.

It is plausible that during the sub-period of 120 days before and after the event day there would be other important corporate announcements and other informative events that might take place. The basic assumption in this analysis is that the event the study is interested in is the most influential event that had occurred during the respective period. It means that in the analysis of mean comparison the study ignores other events that may have a significant impact on trading behaviour. This assumption would make the analysis simpler and the statistics more comparable. In other words, the mean comparison analysis assumes that the confounding effects of other events are minimal, hence, could be ignored.

The most commonly used test statistics of significance to compare two means of variables between the participating companies and the control group is the Student's t -test. Generally, if x_1 and x_2 are independently distributed variables drawn from two normal populations of size n_1 and n_2 with unknown means μ_1 and μ_2 and unknown standard

deviation of s_1 and s_2 , the test statistic comparing the two means is defined as follows,

$$t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad (5.12)$$

where t has t -distribution with $(n_1 + n_2 - 2)$ degree of freedom. The null hypothesis is that the means of the measurement variable are equal for the two groups.

The paired-sample t -test could be applied to measure the effect of the same company before and after the event. Basically the paired-sample t -test measures the difference of variable from the same company before and after the event. The paired t -test assumes that the differences between pairs are normally distributed. The null hypothesis is that the mean difference between paired observations is zero.

In order to compare means for more than two variable or groups, we use one factor analysis of variance or ANOVA. The ANOVA is a powerful and common statistical procedure used in social sciences. In essence, analysis of variance is used to test the null hypothesis that all of the means are equal. This technique is an extension of the two-sample t -test. In addition to determining that differences existing between two means, by using ANOVA we are able to know whether the means are equal across different factor levels. The tests in an ANOVA are based on the F -ratio, the variation due to an experimental treatment or effect divided by the variation due to experimental error. The null hypothesis is the F -ratio equals 1.0 which means that the treatment effect is the same as the experimental error. This hypothesis is rejected if the F -ratio is significantly large enough that the possibility of it equaling 1.0 is smaller than some pre-assigned significant level, p -value, such as 5%.

We extend the analysis by performing multiple comparison procedures. In the SPSS manual, there are 18 methods of performing multiple comparison procedures (Pallant, 2001). We use two of the most commonly used procedures: that is the unrestricted least significant difference (LSD) and Tukey's honest significant difference (HSD). Saville (1990) recommends the unrestricted LSD procedure because many other procedures were found to be inconsistent except the unrestricted LSD procedure or multiple t -test.

Tukey (1949) recommends Tukey's HSD to measure the significance of unplanned pairwise comparison if the ANOVA test gives a significant result. Due to the performing

of multiple significance tests, the chance of finding a statistically significant difference increases. Tukey's HSD test is one of several methods of ensuring that the chance of finding a significant difference in any comparison is maintained at the alpha level of the test. Tukey's HSD test will reveal which means contributed to the effect; that is, which groups are particularly different from each other.

The LSD and Tukey's HSD are examples of post hoc tests or multiple comparison tests that could be used to determine the significant differences between group means in an analysis of variance setting. It is called a post hoc comparison because it is usually performed after obtaining a statistically significant test from the ANOVA.

5.4.2 Event study

The event study methodology is the most powerful tool for researchers to assess the financial impact of a particular event or news announcement. The event study methodology is made popular and well-known by Fama et al. (1969) who examine the effect of the announcement of a stock split on stock prices. Since then, event study methodology is developed by financial economists to assess the performance of securities markets and its application can be seen in the studies such as to estimate the impacts of regulation and other exogenous events on firms or industries (Rucker et al., 2005). The event study methodology is now widely used because of its general capability of being applied in many areas such as accounting and finance and laws.

Event study has become a standard method of measuring security price reactions to some announcement or event. In the study of price reaction to news, event study has been used for two major reasons, firstly, to test the null hypothesis that the market efficiently incorporates information into prices and secondly, to examine the impact of some event on the wealth of the firm's security holders, under the condition that the hypothesis of market efficiency is maintained (Binder, 1998). Due to the wide application of event study methodology, there seems to be relatively little controversy about statistical properties of event study methodology. The conditions under which event studies provide information and permit reliable inferences are well-understood.

In general, in order to assess the impact of an event, we require a measurement whether

there is any abnormal movement of stock return surrounding the date of the event. It means that the stock return will be compared with the ‘normal’ stock return during the event window. A significant abnormal return reflects the impact of the event to stock prices, hence the event is considered an informative event. The normal return is defined as the return would be if the event did not take place. Returns during the event window are compared with normal returns. The differences between event window returns and normal returns are the abnormal returns (MacKinlay, 1997). This section is devoted to describing the model and statistical test that have been used in the literature.

Event definition and sample selection

The initiation of financial analysts coverage organised by a stock exchange is a relatively new practice. As mentioned earlier in Section 2.6, the analysts coverage incentive scheme is a new scheme introduced by Bursa Malaysia. The importance of analyst coverage, and hence the analysts’ initial reports is discussed in Chapter 4.

Identification of the correct event date is crucial in event study. In the study clearly identified. The ‘event’ is the release date of the financial analysts’ initial reports of companies that are involved in the incentive scheme in the Malaysian stock market. We define the ‘financial analysts’ initial reports’ as the first or the initiation reports produced by the analysts involved in the incentive scheme, and not the continuation reports. As the analysts recommendations are usually disclosed in the same analysts reports, the release of the analysts recommendations is also an important event accompanying the release of the analysts’ initial reports. This means the event study also examines the impact of analysts recommendations that go together with the analysts reports.

Companies that are selected in the event study are companies participating in the incentive scheme and their reports are already available. As mentioned earlier in Section 5.3.4, a matching control group is formed so that the results would be comparable. The event date is obviously identified as the date of submission of the analysts’ initial reports. Even though some sophisticated investors may have an idea in which months the analysts reports of a particular company would be released, the exact event date is unanticipated nor the content of the reports.

In the study, we define ‘normal’ time as 220 days before the event to 121 days before the event (day -220 to -121), or 100 trading days of the estimation period. This is the period when the parameters are estimated and the normal return is calculated. It means that this is the return we are expecting if there is no event during this period of time. The event window is the period the study is interested in. A highly deviated return in the event window from the return in normal period suggests that the event has a significant impact.

The normal days or estimation windows usually range from 100 to 300 days for daily studies and from 24 to 60 months for monthly studies. Lengthening the estimation windows involves a trade-off between greater precision of coefficients estimation and the coefficients becoming less representative. In some studies, the event window or the test period is a subset of the estimation windows (Armitage, 1995).

McWilliams and Siegel (1997) suggest that the events should be clearly unanticipated, while the event date should be clearly identified. Some investors may receive the information on the event day prior to the announcement to the public, and therefore trading may take place before the event. Due to the inability to exactly identify the date when the news were released, McWilliams and Siegel (1997) propose a short event window of two days. They argue that the event window should be very short because the underlying assumption in the event study is that the market is efficient that the market could be expected to react very quickly if the event is judged to be informative.

Moreover, McWilliams and Siegel (1997) suggest that a long event window is only justified for events that may have been leaked to or predicted by some traders. In this case, the event window should include a period before the event. Event window that goes beyond the event date is justified for events in which the impact of the event is uncertain. Therefore, in the study various event windows were examined from a long event window of 120 days before and 120 days after the event, i.e. CAR $[-120, 120]$ to a short event window, i.e. CAR $[-1, 2]$. The purpose of using a long event window is to capture any leaking of information or insider trading, while a short event is to capture the immediate impact of the event. Using a long and short event windows provides an insight of the properties of stocks involved in the incentive scheme.

As described in Section 2.6, there are 100 companies initially participating in the incentive scheme. As of the third quarter of 2005, there are 300 companies participating in the scheme out of a total of more than 1,000 companies listed on the stock exchange. After performing the screening tests as described earlier in Section 5.3.2, we obtained the final sample of 55 participating companies.

5.4.3 Models in event study

We use a simple market model to describe the relation between stock return and market return. Following Fama et al. (1969), the basic market model that describes stock prices formation is as follows:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t} \quad (5.13)$$

where $r_{i,t} = \log(P_{i,t}/P_{i,t-1})$ and $R_{m,t} = \log(P_{m,t}/P_{m,t-1})$ are the natural log return of security i and market index respectively. P_i is the price of security i and P_m is the market index. The Kuala Lumpur Composite Index (KLCI) is used to measure market return. The KLCI is a value-weighted market index which is the most popular index used in the Malaysian equity market since 1986. α_i and β_i are the estimated parameters for security i , and $\varepsilon_{i,t}$ is the model error terms or regression residuals. The parameters are estimated using data in the estimation (normal) window.

The market model in equation (5.13) is the most commonly used model in any event-study approach to compute expected returns and no better alternatives has yet been found despite the weak relationship between beta and actual returns (Armitage, 1995; Brown and Warner, 1985; Cable and Holland, 1999). Nevertheless, there are several models that have extended the market model. For example, Fama and French (1996b) expand the single factor model in equation (5.13) into a three-factor model by including firms' size index and firms' book-to-market index to explain stock returns. Meanwhile, Carhart (1997) expands the three-factor model in Fama and French (1996b) by including a short-run momentum index. Due to insufficient data as well as the difficulty to obtain an accurate data, the study is not able to test Fama and French (1996b)'s and Carhart (1997)'s models.

Equation (5.13) provides a decomposition of $r_{i,t}$ into market and firm-specific factors.

The firm-specific return may be interpreted as the unexpected return that results from the event. Determination of the firm-specific return in a given period requires that we obtain an estimate term of $\varepsilon_{i,t}$. The market model in equation (5.13) could be rewritten as follows,

$$\varepsilon_{i,t} = r_{i,t} - (\alpha_i + \beta_i r_{m,t}). \quad (5.14)$$

Equation (5.14) means that the residual, $\varepsilon_{i,t}$, is the stock return over and above what one will predict based on broad market movements in that period, given the stock's sensitivity to the market. The term $\varepsilon_{i,t}$ is widely known as the abnormal return, the return beyond what will be predicted from the market movements alone.

Besides the market model described above, we also use a different model to compute abnormal return. Following Brown and Warner (1980), the model is called market-adjusted return in which the model assumes that the expected returns are equal across securities, but not necessarily constant for a given security. The abnormal return using a market-adjusted return model on any security i is given by the difference between its actual return on security i , $r_{i,t}$, and the actual return on the market portfolio, $r_{m,t}$,

$$\varepsilon_{i,t} = r_{i,t} - r_{m,t}. \quad (5.15)$$

Parameters α and β for each company are estimated using index model regression as in Equation (5.13) in a period before the event occurs using 100 trading days data (i.e day -220 to -121) which we assumed to be the normal period. The abnormal returns for each company surrounding the event date are computed, and the statistical significance and the magnitude of the typical abnormal return is assessed to determine the impact of the event. The study use the market model and the market-adjusted return model since the two models widely used in the application of event studies and they are easy to operate and feed the data needed.

5.4.4 Statistical tests of abnormal return

The general strategy in the event studies is to estimate the abnormal return around the date that new information about a company is released to the market and attribute the abnormal stock performance to the new information. The statistical significance and

magnitude of abnormal returns is assessed to determine the impact of the newly released information. The cumulative abnormal return, which is the sum of all abnormal returns over the time period of interest, is an indication of the total impact of the information release. The cumulative abnormal return thus captures the total firm-specific stock movement for the entire period when the market might be responding to new information (Bodie et al., 2005).

Given the abnormal returns for each model, the statistical significance of abnormal returns within the event window is assessed for each company. The null hypothesis to be tested is that the mean abnormal return on event window day equals zero. It implies that there is no difference between the return gained in the estimation (normal) time and the event window. The significance of the abnormal returns could be tested using parametric or non-parametric methods. In a parametric approach, we assumed that the distribution of the abnormal returns is known such as normal distribution, while in a non-parametric test, we do not make any assumption about the distribution of the abnormal returns. In the study, we test the significance of the abnormal returns using both parametric and non-parametric tests for each of the models used.

In many event studies, the t -test statistic and standardised t -test statistic are the most common and leading tests in parametric approach, while rank and sign test are the leading test statistics in non-parametric method. The t -test statistics and standardised t -test statistic are computed based on Brown and Warner (1985), while the non-parametric tests are based on Corrado (1989). The performance of the test statistics is measured by the power of the test which is the probability of rejecting the null hypothesis when it is false (Gujarati, 2003, pg. 908). Previous studies show that the specification and power of tests used in event studies depend on the characteristics of data.

The t -test statistics uses a time-series of average excess returns and therefore it takes into account cross-sectional dependence of stock excess returns. The abnormal return of each stock is given equal weight in determining the portfolio's abnormal return. This causes the standard deviation of average errors to be higher than if individual errors were independently distributed. Therefore, the t -test statistics are preferable when cross-correlation of returns among companies exists (Armitage, 1995).

The standardised t -test statistics takes into account the differences in error variance or heteroscedasticity in abnormal returns across companies by using a standard deviation normalisation. As it is common that errors varies between companies, this method provides powerful significance test in most cases (Armitage, 1995). The calculation of the statistics for t -test, standardised t -test and rank test are described in the following section.

There a few other methods of testing the significance of errors as outlined by Armitage (1995) such as the cross-sectional method. In this method, observations at times other than time t could be ignored. Errors at time t are treated as a sample without reference to estimation period. This method does not adjust for returns having difference variances or cross-correlated. Other methods of testing the significance of errors as mentioned by Armitage (1995) are prediction error, standardised cross-sectional and generalised least squares.

Nevertheless, in many cases the t -test statistic and the standardised t -test statistic are well-specified and powerful (Armitage, 1995; Brown and Warner, 1985; Prabhala, 1997). Both tests are able to adjust the effects of clustering of events having the same date, cross-correlation and variances differences of returns. Moreover, the rank test method based on Corrado (1989) provides better specification and more power when the variance is unlikely to increase during the event period or when the cross-sectional returns are not symmetry (Campbell et al., 1993; Corrado, 1989; Cowan and Sergeant, 1996).

t -test statistics

The t -test statistic described below is widely used in event studies (Brown and Warner, 1985). The normal days or estimation period is defined from day -220 to -121 or 100 trading days. The normal days are often referred to as the estimation period. We performed screening tests to eliminate IPO and inaccurate datasets. The daily abnormal return for company i at time t is computed as follows,

$$A_{i,t} = r_{i,t} - E(r_{i,t}) \quad (5.16)$$

where $r_{i,t}$ is the observed stock return and $E(r_{i,t})$ is the expected stock return.

Using abnormal return computed from (5.16), the mean abnormal return at time t is computed as follows,

$$\bar{A}_t = \frac{1}{N} \sum_{i=1}^N A_{i,t} \quad (5.17)$$

where N is the number of companies.

The mean abnormal return across companies over the estimation period is given by,

$$\bar{A} = \frac{1}{100} \sum_{t=-220}^{t=-121} \bar{A}_t. \quad (5.18)$$

The standard error of the mean abnormal return for the normal days is given by,

$$\hat{S}(\bar{A}) = \sqrt{\frac{1}{99} \sum_{t=-220}^{t=-121} (\bar{A}_t - \bar{A})^2}. \quad (5.19)$$

Under the null hypothesis, H_0 , that the given event has no impact on the mean or variance of returns, the test for the significance of the mean abnormal return on any day in the event window, \bar{A}_0 is computed as follows,

$$t - test \ statistic = \frac{\bar{A}_0}{\hat{S}(\bar{A})}. \quad (5.20)$$

If \bar{A}_0 are independent, identically distributed and normal, under the null hypothesis the t -test statistic is distributed student- t with 99 degrees of freedom, which is closed to unit normal under null hypothesis.

It is also of interest to examine whether mean abnormal return for periods around the event are equal to zero. First, if the event was partially anticipated, some of the abnormal return behaviour related to the event should show up in the pre-event period. Second, in testing market efficiency, the speed of adjustment to the information revealed at the time of the event is an empirical question. Thus, examination of post-event returns provides information on market efficiency (Kothari and Warner, 2005).

In estimating the performance measure over any multi-period interval, we could accumulate the average residuals to measure the abnormal return during the time horizon. The cumulative abnormal return (CAR) starting at time t_1 through time t_2 is defined as follows,

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t=t_2} A_t. \quad (5.21)$$

The null hypothesis of CAR tests whether the mean abnormal performance is equal to zero. CAR correspond to security holder wealth changes around an event. If CAR is applied to post-event periods, tests using these measures provide information about market efficiency, since systematically non-zero abnormal returns following an event are inconsistent with efficiency and imply a profitable trading rule (Kothari and Warner, 2005).

A test statistic for CAR is typically computed and compared to its assumed distribution under the null hypothesis that mean abnormal performance equals zero. Like the testing of significance of single A_t , the null hypothesis is rejected if the test statistic exceeds a critical value, typically corresponding to the 5% or 1% tail region. The test statistic is a random variable because abnormal returns are measured with error. Two factors contribute to this error. First, predictions about securities unconditional expected returns are imprecise. Second, individual firms realised returns at the time of an event are affected for reasons unrelated to the event, and this component of the abnormal return does not average to literally zero in the cross-section.

For the CAR shown in equation (5.21), a standard test statistic is the CAR divided by an estimate of its standard deviation. The test statistics of the significance of CAR is as follows,

$$t - test = \frac{CAR(t_1, t_2)}{\sigma(t_1, t_2)} \quad (5.22)$$

where

$$\sigma(t_1, t_2) = \sqrt{L}\sigma(A_t) \quad (5.23)$$

where $L = (t_2 - t_1 + 1)$ is the length of the event window and $\sigma(A_t)$ is the standard deviation of the one-period mean abnormal return. Assuming that the abnormal returns, $A_{i,t}$, are not intertemporally correlated (Salinger, 1992), it means that the longer the L or the event window, the higher the variance of CAR. The test statistic is typically assumed unit normal in the absence of abnormal performance.

Standardised t -test statistics

The calculation of the standardised t -test statistics is based on Brown and Warner (1985). Using the abnormal return computed from (5.16), the mean abnormal returns for com-

pany i in the estimation period is given as follows,

$$\bar{A}_i = \frac{1}{T} \sum_{t=-220}^{t=-121} A_{i,t}, \quad (5.24)$$

where T is the number of days in the estimation period. The standard error of the mean abnormal return for company i over the estimation period T is given by,

$$\hat{S}(A_i) = \sqrt{\frac{1}{T-1} \sum_{t=-220}^{t=-121} (A_{i,t} - \bar{A}_i)^2}. \quad (5.25)$$

The significance of the mean abnormal return in the event window, for example, day 0, $A_{i,0}$ is computed as follows,

$$\text{standardised } t - \text{test statistic} = \frac{1}{\sqrt{N}} \sum_{i=1}^N \frac{A_{i,0}}{\hat{S}(A_i)} \quad (5.26)$$

where N is the number of companies. If the standardised abnormal returns are independent across securities, the standardised t -test statistics will converge to unit normal.

The standardised cumulative abnormal return between t_1 to t_2 is given by,

$$SCAR(t_1, t_2) = \sum_{t=t_1}^{t=t_2} A_t / (\sqrt{t_2 - t_1 + 1}). \quad (5.27)$$

The average standardised cumulative abnormal return between t_1 to t_2 is given by,

$$ASCAR(t_1, t_2) = \sum_{j=1}^{j=N} / N. \quad (5.28)$$

The standardised t -test statistics of CAR between t_1 to t_2 is given by,

$$Std - T(t_1, t_2) = ASCAR(t_1, t_2) \cdot \sqrt{N}, \quad (5.29)$$

where $Std - T$ will be distributed Student- t in the absence of abnormal performance (Chan and Fong, 1996).

Rank statistics

Rank statistics used non-parametric approach where the parameter testing does not require any assumption of its distribution. We computed rank statistics as in Corrado (1989), which is described as follows.

Let $K_{i,t}$ denote the rank of the abnormal return for each company i where $A_{i,t}$ are ranked in ascending or descending order. The whole periods from the estimation period to event window are taken into account.

$$K_{i,t} = \text{rank} (A_{i,t}) \quad t = -220, \dots, +120$$

The average rank is one-half plus half the number of observed returns, or 171. The rank statistic, for example day 0, is given as follows,

$$\text{rank statistic} = \frac{1}{N} \sum_{i=1}^N \frac{(K_{i,0} - 171)}{S(K)}$$

where N is the number of companies and $S(K)$ is computed as follows,

$$S(K) = \sqrt{\frac{1}{340} \sum_{t=-220}^{t=+120} \left[\frac{1}{N} \sum_{i=1}^N (K_{i,t} - 171) \right]^2}.$$

The rank statistic converges to unit normal as the number of companies increases.

The rank statistics for CAR between t_1 to t_2 is given by the sum of daily statistics of rank test for t_1 to t_2 divided by \sqrt{L} where $L = t_2 - t_1 + 1$ (Armitage, 1995).

5.4.5 Assumptions of the event study

It is noted by Drew and Veeraraghavan (2002) that small companies in terms of market capitalisation and companies with high book-to-market ratio in the Malaysian stock market generate substantially higher returns. In the study, we are unable to control for the effects of small companies. This is because most of the small companies were traded below the RM1 price and therefore the price data is not accurate. Although we do not manage to control for the effects of small companies, we are able to form a control group that matched the sample companies with the same or similar industry as mentioned earlier in Section 5.3.4. As we will show in the following chapter, the mean market capitalisation in the control group is substantially higher than the sample group. Indirectly, the effects of company size have been analysed and compared. Unfortunately, as we are unable to collect data on companies' book-to-market ratio, so we are unable to comment on the effects of company value.

The inference of significance relies on the following assumption: (1) markets are efficient, (2) the event was unanticipated, (3) there are no confounding effects during the event window (McWilliams and Siegel, 1997). The first assumption that the markets are efficient was discussed earlier in Section 3.6.2. The second assumption that the event was unanticipated is important so that no informed trader has advantage over the other uninformed traders. The unanticipated event means that the abnormal return observed in the event window is assumed to be the results of the market reaction to the event. It is possible that the event was anticipated or information leaked in advance of formal news. In this case, it is difficult to determine when traders became aware of the new information. The third assumption means that there is no other event that could affect the event. Events such as announcement of dividend, mergers or unexpected results could have significant effects on share prices and trading behaviour during the event window. If the other financially relevant events are taking place during the event window, it is difficult to isolate one particular event. Therefore, a longer event window would make it difficult to control the confounding effects (McWilliams and Siegel, 1997).

Although in general the stock market always reacts to the financial related event, it is still possible to have a stock market share price that does not react to the event. In this situation, there may be four possible reasons why this phenomenon may occur (Bhattacharya et al., 2000). First, the stock market may be informationally inefficient, which implies that stock prices are not linked to company values. In such market, share prices would not change when news about the event is released. Second, it is possible that the news or the event does not add any value because the market already knew about the event from other sources of information. Even though the stock market is informationally efficient, prices are left with no new information against which to respond. Third, although a stock market may be efficient or the event may be value-relevant, the event or the news provided may be completely anticipated. In such a market, the event day brings no surprise. Fourth, insider trading prohibitions may not exist in a stock market. Even if they exist, they are not enforced. In this stock market, the superior information of insiders may have been incorporated in stock prices through their trades prior to the announcement of the event. In that case, the event announcement would be news to everyone except the traders. These four reasons could explain why the financial

related event may not really be an event.

5.5 Summary

This chapter has provided the development of the relevant hypotheses that we are going to test. This chapter has explained the data to be used, the variables to be tested, the measurements we are going to use. The models and the tests of statistical significance were also presented. The methodology of analysis was also discussed in this chapter. Details of the formation of control group for the basis of comparison was provided and its limitation is also discussed. Finally, the chapter concludes with the underlying assumptions used in the study. The next chapter presents the findings from the analysis of data.

Chapter 6

Results: The impact of analysts coverage

6.1 Introduction

The previous chapters have outlined the theory of price formation under information asymmetry and the role of financial analysts in providing information as well as developing the hypotheses that we are interested in investigating. The measurements and proxies have also been outlined. In this chapter we analyse the data, present and interpret the results of hypotheses testing and event study analysis. This chapter aims to obtain an understanding on the pattern of data series. We first present comparative statistics between the participating companies and the control group, and then examine the effects of different types of analysts recommendations. Subsequently, we present results from the event study approach and results of the hypotheses tests.

6.2 Participating companies and control group

We have mentioned earlier in Section 5.2.2 that the important event in this study is the release of the financial analysts' initial reports of companies that are participating in the incentive scheme of analysts coverage in the Malaysian stock market. After performing the screening tests mentioned in Section 5.3.2, a total of 55 companies participating in the

incentive scheme of analysts coverage ('participating') are included, while 50 companies are included in the control group of companies ('control'). Selection of companies in the control group is based on the same sector of industry with companies in the participating group as described previously in Section 5.3.4.

Table 6.1 below shows the composition of the companies according to their sector of industry. The sector classification is based on the listing of companies provided by Bursa Malaysia which in turn is usually based on the segmental reports appearing in the companies' annual reports.

Table 6.1: Number of companies in the participating and control groups

Sector of industry	Participating	Control
1. Construction	2	3
2. Consumer Products	4	7
3. Finance	4	5
4. Industrial Products	18	13
5. Plantation	4	4
6. Property	9	7
7. Technology	4	2
8. Trading/Services	10	9
Total	55	50

From Table 6.1 above we find that only one out of eight sectors has an equal number of companies between the participating companies and control groups, while in the other three sectors companies in the control group outnumbered companies in the participating group. The difficulty of finding a matching number of companies between the participating companies and the control group in the remaining sectors is due to the fact that there are many companies, especially small and medium size, that are taking part in the second batch of the incentive scheme of analysts coverage during the third quarter of 2005.

Consequently, companies selected in the control group have bigger market capitalisation than companies in the participating group as shown in Table 6.2. The table shows that the mean market capitalisation in the participating companies is lower than the control group in six out of eight sectors of industry. Furthermore, the difference of mar-

ket capitalisation between the participating and control group is big in each sector. For example, in the finance sector, the mean market capitalisation in participating companies is RM587 million, while in the control group it is RM9,679 million.

Table 6.2: Market capitalisation (RM mil) of companies by sector

Sector of industry	Participating	Control
1. Construction	437	360
2. Consumer Products	990	1,722
3. Finance	587	9,679
4. Industrial Products	1,012	363
5. Plantation	171	2,716
6. Property	408	823
7. Technology	445	2,075
8. Trading/Services	698	4,607
Mean	700	2,570
Std. deviation	1,803	6,891
Coef. of variation	2.57	2.68
Maximum	13,060	37,802
Minimum	50	57

Although the mean of market capitalisation in the participating group is lower than the control group and the difference between the participating and control group is big, in aggregate the distribution of the control group is slightly higher and wider than in the participating group. This is indicated by a higher coefficient of variation in the control group as shown in Table 6.2. The coefficient of variation is the ratio of the standard deviation to the mean. A higher ratio means a wider distribution. This means that although the control group has higher mean market capitalisation, the distribution of market capitalisation in the control group is also slightly wider than in the participating group.

Table 6.3 shows the distribution of market capitalisation based on the same interval. Most of the companies in the participating group have market capitalisation in the range between RM100 to RM500 million, i.e. 36 out of 55 companies. On the other hand, 20 out of 50 companies in the control group are in the range of more than RM1 billion. It

clearly shows that the companies in the control group are bigger than the participating group. Nevertheless, we have shown that the difference of distribution of companies in each group is not substantial and therefore the difference between the participating and control group is still comparable, which will be supported by the results in the following sections.

Table 6.3: Market capitalisation (RM mil) - participating vs. control groups

Size	Participating	Control
Less than RM100 mil	6	6
Between RM100-500 mil	36	14
Between RM501-RM1 bil	5	10
More than RM1 bil	8	20
Total	55	50

6.3 Submission of analysts reports

The earliest date the analysts' initial report submitted to Bursa Malaysia was 23 March 2005 and based on the cut-off date of 31 August 2005, the last date the analysts report submitted was 9 May 2005. Table 6.4 below shows the date of the submission of the analysts' initial reports and their respective recommendations for the 55 sample companies participating in the incentive scheme.

Table 6.4: Distribution of submission of the analysts' initial reports and their recommendations

Reports date	Analysts recommendations		Total no. of companies
	Buy	Hold	
Mar-05	2	2	4
Apr-05	26	22	48
May-05	1	2	3
Total number of reports	29	26	55

As we can see from Table 6.4, there is no recommendation to sell a security in the 55 participating companies. All of the 55 recommendations are unique for each company, thus, there is no overlapping of companies recommended by the analysts, even though one analyst may be covering more than one company. It is also noted from Table 6.4 that the ratio of buy to hold is fairly equal throughout the time period. Therefore, it is reasonable to conclude that in preparing the first or initiation reports, the analysts are fairly generous by issuing favourable recommendations to most of the companies participating in the incentive scheme, with more than half getting a buy recommendation and the rest a hold recommendation and nil for a sell recommendation.

We have discussed earlier in Section 5.3.4 that the study is using a control group for comparison purposes. Control group is important because it helps to make the comparison more conclusive. As mentioned earlier, we select companies in the control group that matched with the sector of industry in the participating companies. The sectoral information can be obtained from the classification of the Bursa Malaysia listing. We use the same screening technique discussed earlier in Section 5.3.2 to select companies in the control group. After performing the screening tests, we manage to collect clean and reliable data series for 50 companies to be included in the control group.

Due to the fact that there is no actual event date for companies in the control group, it is convenient and plausible to select the event date based on the dates from the 55 sample of companies participating in the incentive scheme. It will be more convenient to select only a single event date for all of the companies in the control group. However, a common event date will create a clustering effect. Clustering effect refers to an event that happens on the same calendar time period. The general impact of clustering is that it lowers the independence of securities on the event date (Brown and Warner, 1980). Cross-sectional dependence due to clustering violates the assumptions of independence in ordinary least squares (OLS) parameter estimations which can yield biased estimates of standard errors, and lead to incorrect inferences (Bernard, 1987).

Essentially, the effects of clustering is that the residuals are positively correlated across securities in calendar time so that it increases the variance of residuals and hence lowers the power of tests. Effectively, the null hypothesis will be rejected too frequently even

in the absence of significant abnormal returns (Brown and Warner, 1980). Eventually, we choose five event dates and systematically assign the dates to the companies in the control group in which each of the ten companies will have a common event date. By using five different event dates in the control group, the effects of clustering would be reduced as shown in Section 6.4.2.

6.4 Effects of analysts reports

In the following sections, we divide the data series into three sub-periods namely: before event (BE), event day (ED) and after event (AE). BE refers to the sub-period of 120 trading days or nearly six calendar months before the event date, ED refers to the event day itself and AE refers to a sub-period of 120 trading days after the event day. None of the sub-periods overlap with each other. The event in question is the release day of analysts' initial reports. There is only one event date for each company. In total, there are 17 unique event dates in the participating group and 5 unique event dates in the control group.

Earlier in Section 5.2.2, we have stated that the hypotheses we are going to test involved the variables directly affected as a result from the initiation of financial analyst coverage. We have also discussed in the earlier chapters that previous studies find that variables such as stock valuation, stock return, trading volume and bid-ask spread are directly affected and related to financial analysts coverage.

Based on the sub-periods above, in the next section we compare the statistics of each variable between the sub-periods and between the participating companies and the control group. In particular, the study is interested in examining the differences of effects between the groups by comparing the means of each variable mentioned earlier. By examining the comparable statistics, we are able to identify the effects of the release of analysts reports which is directly related to the effects of analysts coverage.

6.4.1 Stock valuation

Earlier results in Section 6.2 show that companies in the control group inevitably have higher market capitalisation because many small and medium companies are participating in the second batch of the incentive scheme and therefore are not selected to be in the control group. As the control group is significantly bigger than the participating company in terms of market valuation, we use the paired-sample t -test, instead of the usual independent t -test, to measure the differences in stock valuation in each group. Basically the paired t -test measures whether the differences of stock valuation from the same company before and after the event are statistically different from zero.

Table 6.5: Changes of stock valuation in the participating companies

	<u>Paired differences</u>				
	Mean diff.	Std. Dev.	Std. Error Mean	t -value	p -value
BE - ED	0.056***	0.141	0.019	2.958	0.005
BE - AE	0.098***	0.262	0.035	2.763	0.008
ED - AE	0.041	0.188	0.025	1.623	0.110

note: BE= 120-day before event, ED= event day, AE= 120-day after event,
*** significant at 1% level

Table 6.5 compares the differences of stock valuation between each pair of sub-periods. BE refers to the mean stock valuation of 120-trading days before the event day, ED is the mean stock valuation on the event day, and ED is the mean stock valuation of sub-period 120-trading day after the event. Stock valuation of participating companies in the 120-day before the event is significantly higher than on the event day and in the sub-period 120-day after the event (t -value=2.958 and 2.763 respectively). If the analysts reports were important and influential in increasing investors' optimism, then the stock valuation on the event day onwards would be higher than before. Subsequently, stock valuation would be higher in the sub-period after the event day.

It is obvious that Table 6.5 does not exhibit any significant increase in stock valuation on the event day and in the sub-period after the event day. Instead, stock valuation on the event day is significantly lower than in the sub-period before the event. The statistically

significant difference of market valuation implies that the analysts coverage is not able to push up market valuation. It means that the release of the analysts' initial reports is not an important nor an influential event to investors.

We replicate the same analysis in the control group and find that similar results and pattern of changes in stock valuation prevailed. Basically, we find that the mean stock valuation in the control group is declining over time. The mean stock valuation of 120-day before the event is significantly higher than that on the event day, while the mean stock valuation on the event day is substantially higher than that of 120-day after the event day. Although stock valuation in the control group is inevitably higher than the participating companies as we discussed earlier in Section 6.2, the pattern of changes in stock valuation for the participating companies and the control group is comparable. In other words, both the participating and control group are experiencing a declining valuation during the period under study.

Essentially, we conclude that there is not enough evidence to show that the analysts coverage has a significant effect on stock valuation of companies that are participating in the incentive scheme.

6.4.2 Stock return

Stock return measures the profitability of an investment opportunity during a specified time horizon. The same definition of sub-periods is applied and the same analysis is performed. Table 6.6 compares the differences of stock return in the participating companies for each pair of sub-periods and the t -value measures whether the differences of stock return are different from zero. If the analysts reports had any substantial effects in reducing information asymmetry and adverse selection among investors, then investors would react accordingly by purchasing more stocks due to a lower risk of trading after the reports were released. Consequently, stock return on the event day and in the sub-period after the event day would be higher than before the event.

Table 6.6 does not show that there is any significant changes of the stock return in companies that are taking part in the analysts coverage scheme. Stock return on the event day is not significantly higher than that in the other sub-periods. Neither stock

Table 6.6: Changes of stock return (%) in the participating companies

	Paired differences			<i>t</i> -value	<i>p</i> -value
	Mean diff.	Std. Dev.	Std. Error Mean		
BE - ED	0.081	1.025	0.138	0.585	0.561
BE - AE	0.043	0.249	0.034	1.273	0.208
ED - AE	-0.038	1.027	0.139	-0.276	0.784

notes: BE= 120-day before event, ED= event day, AE= 120-day after event

return in the sub-period after the event is higher than the others. The insignificant result implies that the market does not react to the analysts report, and therefore there is not enough evidence that the release of the analysts' initial reports is an important event to investors. As stock price will react to the arrival of new information, the insignificant result means that there is no new information in the analysts reports. In other words, the market does not view that the analysts reports bring new information.

We perform the same analysis in the control group and find that similar results and patterns of changes in stock return among companies in the control group prevailed. Basically, we find that the pattern of stock return movements between the participating companies and the control group is very similar in terms of trend and magnitude of stock return. This can be seen in Table 6.7 which exhibits the comparisons of mean stock return between the participating companies and the control group for each sub-period. Obviously, Table 6.7 indicates that there is no significant differences in stock return between the participating companies and the control group in each sub-period, although the control group has a bigger market valuation than the participating group.

Table 6.7: Stock return (%) - participating vs. control group

Sub-period	Participating	Control	Diff.	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	-0.060	-0.060	0.000	0.300	0.976
Event day	-0.141	-0.230	0.089	0.384	0.702
After event	-0.102	-0.085	-0.017	-0.399	0.691

Previously, in Section 6.3, we stated that the control group is systematically assigned

with five different event dates. Empirically, by using a single common date for companies in the control group, we find a significant difference of daily return between the participating companies and the control group at 5% significant level on the event day (on day $t=0$, t -value=2.919 and p -value=0.004). However, by using five different event dates for companies in the control group, we find that there is no significant difference of mean daily return between the participating companies and the control group on the event day as shown in Table 6.7. The result is consistent with the effects of clustering as suggested by Brown and Warner (1980). By using five different event dates for companies in the control group, essentially the effects of clustering is reduced and the null hypothesis is not rejected.

From Table 6.7 there is no evidence that there is any significant difference of mean daily return between the participating companies and the control group in any of the sub-periods. It means that the release of the analysts' initial reports does not generate higher investment returns in companies that are participating in the incentive scheme than the companies that do not participate. Therefore, there is no evidence that the release of analysts' initial reports is a significant event to the companies that are involved in the incentive scheme.

Table 6.8: ANOVA of daily return

	Sum of Squares	df	Mean Square	F -value	p -value
Between groups	1.07	5	0.214	0.428	0.829
Within groups	54.23	309	0.499		
Total	155.30	314			

We further investigate the differences of daily return across sub-groups. By assuming that the daily return in sub-periods of the participating companies and the control group are randomly independently distributed, the one-way analysis of variance (ANOVA) of mean daily return is performed. The F -value measures whether the differences of mean returns between the groups are statistically different from zero. Results shown in Table 6.8 show that the F -value and p -value is 0.428 and 0.829 respectively, which are not statistically significant from zero. It means there is no statistical significant difference

of daily return in any of the groups, either between the participating companies and the control group, or between the sub-periods and other groups. It is an indication that the mean stock return across the groups are equal.

Table 6.9: Multiple comparisons of daily return (%) among participating companies

Comparison procedure	(I)	(J)	(I-J)	Std. Error	<i>p</i> -value
Tukey HSD	BE	ED	0.081	0.135	0.991
	BE	AE	0.043	0.135	1.000
	ED	BE	-0.081	0.135	0.991
	ED	AE	-0.038	0.135	1.000
	AE	BE	-0.043	0.135	1.000
	AE	ED	0.038	0.135	1.000
LSD	BE	ED	0.081	0.135	0.549
	BE	AE	0.043	0.135	0.751
	ED	BE	-0.081	0.135	0.549
	ED	AE	-0.038	0.135	0.777
	AE	BE	-0.043	0.135	0.751
	AE	ED	0.038	0.135	0.777

notes: BE= before event, ED= event day, AE= after event

We verify our results of statistics tests by using multiple mean comparison procedures which are used to compare means of daily stock return in the groups between sub-periods, the participating companies and the control group. The differences of mean stock return between the groups are compared with the pre-determined significance level (*p*-value). Results of multiple comparison is shown in Table 6.9. Due the length of the analysis of LSD and Tukey's HSD procedures, only the portion of mean comparison between the participating companies is shown in Table 6.9. The LSD and Tukey's HSD procedures do not show any significant statistical tests. It means that no daily returns in any of the sub-periods in the participating companies or in the control group is significantly higher or lower than the others. Results from the multiple mean comparison using LSD and Tukey's HSD procedures are consistent with the ANOVA results shown in Table 6.8.

Results from *t*-test, ANOVA and multiple comparison procedures indicate that there is no significant difference in daily returns observed between the participating companies

and the control group, neither prior to nor after the release of the analysts' initial reports nor on the release day of the reports. Although companies in the control group are bigger than companies in the participating group in terms of market capitalisation, there is no substantial difference of stock return observed between the two groups. Therefore, the insignificance statistical tests imply that there is no new information upon the release of the analysts' initial reports. It is also implied that the analyst report is not an important document or an influential event in the Malaysian stock market.

6.4.3 Trading volume

Table 6.10 shows the differences in mean daily trading volume between the participating companies and the control group. Trading volume is measured by turnover which is raw trading volume divided by the number of outstanding shares. Results in Table 6.10 shows that in each of the sub-periods, the mean daily turnover in the control group is higher than the participating group and the differences are statistically significant from zero at the 1% and 10% level. The results are expected as the component of control groups has more larger companies than the participating group. As big companies usually are traded heavier than the small companies, the higher trading volume in the control group is consistent with the literature.

Table 6.10: Daily turnover (%) - participating vs. control group

Sub-period	Participating	Control	Diff.	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	0.080	0.179	-0.099*	-1.821	0.074
Event day	0.040	0.136	-0.097***	-2.813	0.004
After event	0.065	0.136	-0.071*	-1.758	0.084

notes: *** significant at 1%, * significant at 10%

However, the mean daily turnover in the participating group in the sub-period after the event is lower than that in the sub-period before the event, which means that the financial analysts failed to generate new interest or influence investors to trade more aggressively than usual upon the release of analysts reports. It implicates that there is no significant news in the analysts reports. If there was any new significant information

from the analysts reports, then there would be a significant increase in trading activities on the release day of the analysts reports. However it is observed that trading activities in the participating group on the event day are lower than that in the sub-period before the event.

We continue our analysis by comparing mean daily turnover across sub-periods in the participating companies and the control group. Based on one-way ANOVA shown in Table 6.11, we find that the F -value of 3.152 is statistically significant at the 1% level which is consistent with the t -test performed earlier. The significance of F -value means that there is a significant difference of mean daily turnover between at least one pair of the groups. It means that daily trading activities are not equal across sub-periods and groups in the participating and the control companies.

Table 6.11: ANOVA of daily turnover

	Sum of Squares	df	Mean Square	F -value	p -value
Between groups	0.73	5	0.146	3.152***	0.009
Within groups	14.31	309	0.046		
Total	15.04	314			

notes: *** significant at 1% level

Since the ANOVA results show significant differences in stock turnover across groups and sub-periods, the multiple mean comparison procedures are performed in order to identify which pairs have significant differences. Results from multiple mean comparison procedures using LSD and Tukey's HSD procedures are consistent with the ANOVA results above. Due to the length of the statistics results, only a portion of the multiple mean comparison procedures is shown as in Table 6.12. The multiple mean comparison procedures reveal that there is a significant difference of daily turnover between the groups.

In particular, the multiple mean comparison procedures reveal that stock turnover on the event day for the participating group is significantly lower than the other three sub-groups in the control group and the differences are significant from zero at the 1% and 5% level. Even by excluding eight companies in the participating group and two

Table 6.12: Multiple comparisons of daily turnover (%) among participating companies

Comparison procedure	(I)	(J)	(I-J)	Std. Error	<i>p</i> -value
Tukey HSD	ED (P)	BE (P)	-0.041	0.041	0.921
	ED (P)	AE (P)	-0.026	0.041	0.989
	ED (P)	BE (C)	-0.140**	0.042	0.013
	ED (P)	ED (C)	-0.097	0.042	0.196
	ED (P)	AE (C)	-0.096	0.042	0.202
LSD	ED (P)	BE (P)	-0.041	0.041	0.322
	ED (P)	AE (P)	-0.026	0.041	0.532
	ED (P)	BE (C)	-0.140***	0.042	0.001
	ED (P)	ED (C)	-0.097**	0.042	0.022
	ED (P)	AE (C)	-0.096**	0.042	0.023

notes: BE= before event, ED= event day, AE= after event,

(P)= participating group, (C)= control group,

*** significant at 1%, ** significant at 5%

companies in the control group that are not traded on the event day, trading volume in the participating group is still significantly lower than the control group on the event day and the difference is statistically significant from zero (t -value=-2.675, p -value=0.010).

In addition to the lower stock turnover in the participating companies, the multiple mean comparison procedures show that within the participating companies, there is no significant difference of stock turnover among the sub-periods. Therefore, we find no evidence that there is significant change in trading activities among companies that are participating in the incentive scheme. The significantly lower stock turnover on the event day means that the analysts reports are not influential or informative in persuading investors to trade in the shares of companies participating in the incentive scheme. Similarly, trading volume in the control group does not improve in the sub-period after the event day.

As both the participating and control group show similar trends of trading volume over the same sub-period, the statistical tests imply that the analysts reports are not influential enough to attract investors to trade in more shares. The results are consistent with our previous results mentioned in Section 6.4.1 and 6.4.2. It implies that the analysts

reports do not influence more trading as investors may find the analysts reports have no new information or insights, and therefore there is no reaction observed upon the release of the reports.

6.4.4 The bid-ask spread

Our next analysis is the bid-ask spread. Essentially, the bid-ask spread measures costs of trading of shares in the stock market. Three major components of bid-ask spread according to Stoll (1989) are order processing costs (47%), adverse information costs (43%), and inventory holding costs (10%). Higher bid-ask spread means higher cost of trading.

Table 6.13 shows that the bid-ask spread in the participating group is higher than in the control group. This could be due to the fact that big companies in the control group outnumbered the big companies in the participating group and as the big companies are traded more frequently, the big companies usually have a lower bid-ask spread.

Table 6.13: Daily bid-ask spread (%) - participating vs. control group

Sub-period	Participating	Control	Diff.	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	1.529	1.173	0.356***	2.686	0.008
Event day	1.551	1.291	0.260	0.746	0.467
After event	1.777	1.404	0.373*	1.861	0.066

notes: *** significant at 1%, * significant at 10%

Results in Table 6.13 show that the difference of bid-ask spread between the participating companies and the control group is statistically significant from zero at the 1% significant level for the sub-period before the event and at 10% for the sub-period after the event. The significant difference of bid-ask spread in the sub-period before and after between the participating companies and control group implies that the costs of trading is higher in the participating group than that in the control group. It means that there is higher adverse information cost in the participating companies than in the control group. Apparently, the release of the analysts' initial reports are not able to reduce adverse information among traders.

Nevertheless, the difference of the bid-ask spread on the event day is not significant from zero. After removing eight companies in the participating group, the difference is still not significant from zero (t -value=1.402, p -value=0.165). The result implies that the analysts reports are capable of reducing adverse information among traders at least on the day of release of the reports. It means that the result is not sustainable, and therefore the effect of analysts reports in reducing costs of trading only appears on the event day.

We continue our analysis by comparing mean daily bid-ask spread across sub-periods in the participating companies and the control group by performing a one-way ANOVA test. The results shown in Table 6.14 supports the evidence that there is no significant difference of the bid-ask spread across the sub-periods and between the participating companies and the control group. The F -value of 1.498 means that the differences are not statistically different from zero at the 5% significant level. It means that none of groups across sub-periods have significantly higher bid-ask spread than the others.

Table 6.14: ANOVA of the bid-ask spread

	Sum of Squares	df	Mean Square	F -value	p -value
Between groups	11.94	5	2.39	1.498	0.190
Within groups	492.57	309	1.59		
Total	504.50	314			

The multiple mean comparison procedures using the unrestricted LSD and Tukey's HSD are applied for each pair of sub-groups. The results are consistent with the t -test performed earlier. In addition to the existing t -test results, the procedures reveal that the bid-ask spread for the participating group in the sub-period after the event is significantly higher than the bid-ask spread in the control group for the sub-period before and on the event day. This means that the bid-ask spread for the participating group is not reduced after the event.

Nevertheless, the results show that within the participating group, the difference of bid-ask spread between the sub-periods is not statistically significant. Similar results prevail within the control group in which the difference is not significant between the

sub-periods. It means that the participating companies have equal mean bid-ask spread in the sub-period before the event, on the event day and in the sub-period after the event. Therefore, there is no absolute evidence that the release of the analysts' initial reports have a significant impact on reducing the cost or risk of trading of shares in the participating companies. It reflects that the analysts coverage is not able to reduce information asymmetry among investors.

6.4.5 The illiquidity measures

We have shown earlier in Section 5.3.3 that Amihud (2002) proposes the measure of stock illiquidity, λ_a , as follows,

$$\lambda_a = \frac{|r|}{VOL} \quad (6.1)$$

where r is stock return and VOL is raw trading volume. λ_a is considered zero if there is no trading of the company's share. High λ_a means the stock is highly illiquid, while low λ_a means the stock is highly liquid.

Table 6.15: Illiquidity measure, λ_a - participating vs. control group

	Participating	Control	Diff.	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	2.180	0.942	1.238**	2.167	0.033
Event day	1.229	0.374	0.855*	1.782	0.079
After event	2.298	1.221	1.077*	1.678	0.097

notes: ** significant at 5%, * significant at 10%

The differences of illiquidity measure between companies participating in the scheme and the control group is shown in Table 6.15. The illiquidity measure in the participating group is higher than in the control group for all sub-periods in which the difference is significant from zero at 5% significant level for the sub-period before the event day and 10% for the other two sub-periods. The higher λ_a in the participating group could be due to the company size in which the participating group is smaller than the participating group in terms of market capitalisation. Although λ_a is higher in the participating group, λ_a for the participating group on the event day is lower than that of the sub-period before

the event as well as the sub-period after the event day. A similar pattern is also noted in the control group. It seems that a lower λ_a on the event day means that the analysts reports do have a moderate effect in reducing illiquidity measure.

We continue our investigation by performing the one-way ANOVA across sub-periods in the participating companies and the control group. Table 6.16 shows the F -value of 3.297 and p -value of 0.006. This means that the difference of λ_a among the participating companies and the control group across sub-periods is statistically significant at 1% level in at least one pair of groups, and therefore there is at least one group that has significantly higher or lower λ_a than the others.

Table 6.16: ANOVA of illiquidity measure, λ_a

	Sum of Squares	df	Mean Square	F -value	p -value
Between groups	144.0	5	28.81	3.297***	0.006
Within groups	2,700.2	309	8.74		
Total	2,844.2	314			

notes: *** significant at 1%

We then continue further by analysing the multiple mean comparison using the LSD and Tukey's HSD procedures. Essentially, the procedures measure the differences of λ_a between the groups across sub-periods. Table 6.17 shows a portion of the mean comparison procedures results which are consistent with the ANOVA results produced earlier. The LSD measures exhibit a few pairs of groups that have differences of λ_a significant from zero at 1% and 5% level. Essentially, Table 6.17 shows that λ_a among the participating companies have not changed after the event, and therefore the illiquidity measure is not improving even after participating in the incentive scheme.

Although λ_a in the participating group is inherently higher than that of the control group which is due to the smaller company size in the participating group, there is no significant difference of λ_a between sub-periods within the participating group. Similar pattern of results are also observed within the control group. The results show that the analysts reports are not influential and informative in helping to reduce adverse selection costs of trading or the risk of trading. Therefore the reports do not have significant effects

Table 6.17: Multiple comparisons of illiquidity measure, λ_a

Comparison procedure	(I)	(J)	(I-J)	Std. Error	p-value
LSD	BE (C)	BE (P)	-1.238**	0.578	0.033
	BE (C)	ED (P)	-0.287	0.578	0.619
	BE (C)	AE (P)	-1.356**	0.578	0.020
	BE (C)	ED (C)	0.568	0.591	0.338
	BE (C)	AE (C)	-0.279	0.591	0.638
	ED (C)	BE (P)	-1.805***	0.578	0.002
	ED (C)	ED (P)	-0.855	0.578	0.140
	ED (C)	AE (P)	-1.923***	0.578	0.001
	ED (C)	BE (C)	-0.568	0.591	0.338
	ED (C)	AE (C)	-0.846	0.591	0.153

notes: BE= before event, ED= event day, AE= after event,

(P)= participating group, (C)= control group,

*** significant at 1%, ** significant at 5%

in increasing the ease of trading, hence illiquidity is not improving.

Previously in Section 5.3.3, we has proposed an alternative method to measure stock illiquidity, λ_b , which is based on Amihud (2002). The proposed illiquidity measure, λ_b is calculated, as follows,

$$\lambda_b = \frac{|r|}{\frac{VOL}{Share}} \quad (6.2)$$

where r is stock return, VOL is raw trading volume and $Share$ is the outstanding units of shares. λ_b is considered zero if the share is not traded. High λ_b means the stock is highly illiquid, while low λ_b means the stock is highly liquid. By putting a weight of $Share$ to λ_b , the illiquidity measure is independent of the company size.

The alternative illiquidity measure shown in Table 6.18 is similar with the first version of illiquidity measure shown in Table 6.15. Consistent with the first version of illiquidity measure, λ_a , the alternative illiquidity measure, λ_b , in the participating companies is higher than that in the control group in each sub-period. However, the differences of λ_b between the participating companies and the control group is only significant at the 10% level only for the sub-period before the event, instead of all three sub-periods. This means that the alternative measure of illiquidity λ_b is slightly better in the sense that it

has reduced the magnitude of illiquidity.

Table 6.18: Alternative illiquidity measures, λ_b - participating vs. control group

	Participating	Control	Difference	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	265	144	121*	1.686	0.095
Event day	127	42	85	1.642	0.105
Before event	262	198	65	0.770	0.443

notes: * significant at 10%

We continue our investigation by performing the ANOVA across sub-periods for the participating companies and the control group. The results are shown in Table 6.19 in which the *F*-value and *p*-value is 2.950 and 0.013 respectively. It means that there is at least one group that has significantly higher λ_b than the others. Again, it shows that the results are consistent despite using an alternative illiquidity measure λ_b .

Table 6.19: ANOVA of alternative illiquidity measure, λ_b

	Sum of Squares	df	Mean Square	<i>F</i> -value	<i>p</i> -value
Between groups	1,944,193	5	388,839	2.950**	0.013
Within groups	40,723,020	309	131,790		
Total	42,667,213	314			

notes: ** significant at 5% level

The multiple mean comparison procedures using the LSD are performed across sub-periods in the participating companies and the control group. The results are consistent with the ANOVA results in which there is a significant difference of alternative illiquidity measure, λ_b , between the participating companies and the control group across sub-periods. This reflects that the level of illiquidity in the participating group is higher than the control group and this could be due to the component of the control group which has more big companies than the participating group. Big companies are usually more liquid than small companies due to the larger number of outstanding shares available in the market as well as a smaller portion of shares held by the management of the companies.

Basically, the results show that both illiquidity measures, λ_a and λ_b , are higher in the participating group than the control group, which means that the participating companies are less liquid than the control group. This shows that the analysts reports are not informative or influential to attract investors to trade. It could be due to the inability of the analysts report to convince investors that the risk of trading has reduced as there is less information asymmetry following the release of analysts reports. This could be due to the content of the analysts reports which do not reveal any new information to investors. Consequently, there is no significant change of illiquidity measures, λ_a and λ_b , within the participating companies as the risk of trading is still unchanged.

6.4.6 Summary of the results of the effects of analysts reports

In summary, the study has examined the effects of the release of the analysts' initial reports on companies that are participating in the incentive scheme of financial analysts coverage. A group of companies matched by the respective sector is formed as a control group for the basis of comparison. Among the variables directly related and commonly used to measure the effects of a particular are stock valuation, returns, trading volume, bid-ask spread and the illiquidity measures. The variables are relatively easy to obtain from various sources and investors could prepare the datasets on their own.

Table 6.20 presents the summary of the variables that have been used and analysed from Section 6.4.1 to 6.4.5. In general, Table 6.20 shows that there is no significant improvement in the companies participating in the incentive scheme based on the measurements using the variables above. In particular, the study finds that there is no concrete and clear evidence that the release of financial analysts' initial reports have any significant impact. The sub-period 'Before' and 'After' is 120-trading day before and after the event respectively, while 'Event' is the event day itself.

The study finds that there is no significant difference between the participating and control group in terms of stock return, despite the fact that the market valuation for the control group is bigger than the participating group. Big companies usually attract more analysts coverage and generate higher return due to higher interests and demand from investors. This could lead stock return in the control group to be higher than the

Table 6.20: Summary of the results of each variable

Variable	Participating			Control		
	Before	Event	After	Before	Event	After
1. Stock valuation (RM mil)	291	275	264	658	610	586
2. Stock return (%)	-0.060	-0.141	-0.102	-0.060	-0.230	-0.085
3. Stock turnover (%)	0.080	0.040	0.065	0.179	0.136	0.136
4. Bid-ask spread (%)	1.529	1.551	1.777	1.173	1.291	1.404
5. Illiquidity measure, λ_a (x1000)	2.180	1.229	2.298	0.942	0.374	1.221
6. Illiquidity measure, λ_b	265	127	262	144	42	198

participating group. However, there is no significant difference of stock return. This result means that the stock return in the participating group is no different from the control group which could be attributed to the analysts coverage scheme that has enabled a slightly higher demand for shares. Nevertheless, the performance of share price of companies participating in the incentive scheme do not substantially improve after the release of the analysts' initial reports that it still could not outperform the control group.

Inevitably, due to the difference of composition between the participating and control group, there are significant differences of stock valuation, trading volume, the bid-ask spread and the illiquidity measures between the participating and control group for some of the sub-periods or across sub-periods. In other words, in most of the statistical tests that have been performed, there is significant difference of measurement of variables between the participating companies and the control group. The results are consistent with the literature mentioned earlier in Section 5.3.4.

Despite the difference in the market valuation between the participating and control group, the study finds that the statistics is comparable. This is because the times series of the participating and control group show that the trend of the variables is closed and similar with each other, although the differences of magnitude of measurements could be substantial. For example, as shown in Section 6.7 the movement of time series of stock valuation for the participating and control group is relatively closed and similar with each other, although the mean stock valuation for the control group is nearly three times bigger than the participating group.

Furthermore, most of the statistical tests within the group itself do not give significant results particularly in the participating group as shown from Section 6.4.1 to 6.4.5. This means that the release of the financial analysts' initial reports are not highly influential nor informative. The results imply that the content of the analysts reports do not reveal any new information and the information disclosed in the reports is already known in general. As a result, there is no immediate response or any substantial change observed in the respective variables after the release of analysts reports (Bodie et al., 2005).

The insignificant results on many statistical tests might also imply that the transactions on Bursa Malaysia is costly. This means that both explicit and implicit transaction costs are high, hence the expected return to be gained from the acquisition of information and knowledge should also be high enough to cover the transaction costs (Grossman and Stiglitz, 1980). However, the expected return might not be sufficiently high and therefore the market response to the release of analysts reports would be low. As a consequence, the release of analysts reports is seen as a non-event and non-informative.

The release of analysts reports could also lead investors to have a homogenous valuation of a particular risky asset. It could result in a convergence of valuation of the risky asset, hence demand for the shares increases. However, if the market has a high cost of transactions, trading would be affected and less trading would be observed (Barron and Karpoff, 2004). The results could also imply that the high cost of trading in the Malaysian stock market means that information asymmetric is large, particularly in the participating group. This means that the analysts reports have no significant impact on information asymmetry, hence trading cost that is associated with information asymmetry is still relatively high (Silva and Chavez, 2002). We will further discuss the implication of the results in the next chapter.

6.5 Effects of different type of recommendations

In the following sections, we continue our analysis by examining the difference within the participating companies. In particular we are interested in examining the difference between the two types of recommendations. As shown earlier in Table 6.4, out of 55

companies in the sample of the participating group, 29 are buy recommendations and 26 are hold recommendations. Similar with the approach used in Section 6.4, data series are divided into three sub-periods. Essentially, the purpose of this analysis is to investigate and compare the means of each variable between companies receiving the buy or favourable recommendations and companies receiving the hold or less favourable recommendations. By examining the comparable statistics, we are able to identify the effects of different types of analysts recommendations on companies that are taking part in the incentive scheme.

6.5.1 Recommendations effects on stock valuation

In the earlier analysis the results are shown in Table 6.5 in which we find that stock valuation in the participating companies in the sub-period before the event is significantly higher than that on the event day and in the sub-period after the event. It means that the earlier results do not reflect that the analysts reports have any significant impact on stock valuation. In the subsequent analysis, Table 6.21 shows the difference of stock valuation between companies with favourable recommendations (buy) and companies with less favourable recommendations (hold). The results show that there is no significant difference of stock valuation between companies with the buy or hold recommendations. This implies that the favourable recommendations do not have a significant impact on stock valuation.

Table 6.21: Stock valuation - buy vs. hold recommendations

	Buy	Hold	Difference	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	12.49	12.69	-0.21	-0.705	0.484
Event day	12.46	12.60	-0.14	-0.498	0.621
After event	12.41	12.56	-0.14	-0.484	0.631

Further investigation using one-way ANOVA test reveals that there is no significant difference of stock valuation among the groups. This means that there is no significant change of stock valuation between the groups of buy and hold across sub-periods. It means that the stock valuation is not affected by the analysts recommendations regardless of

whether the recommendations are favourable or less favourable, and therefore the analysts recommendations are not influential to have an impact on investors' opinion. As there is no change in investors' opinion, there is no change in the demand to buy shares, and therefore there is no change in stock valuation.

In other words, the analysts' optimism by issuing the buy recommendations have not influenced the market to change its outlook of companies' valuation. Similar with our previous analysis, the results imply that the analysts recommendations are not highly influential because investors might consider that the analysts recommendations are not informative enough, and therefore even the favourable recommendations do not influence investors to become more optimist.

6.5.2 Recommendations effects on stock return

Previously in Section 6.4.2, we find that there is no significant difference of stock return between the participating companies and control group. The analysis is continued by examining the difference between the type of recommendations issued by the analysts. Basically, we compare the statistics of mean daily return between the two recommendations in each sub-period shown in Table 6.22. Returns in companies with buy recommendation are significantly higher than those in companies with the hold recommendation at 10% significant level during the sub-period before the event. However, consistent with our result mentioned earlier in Table 6.7, we find that there is no significant difference of mean stock return between the buy and hold recommendations on the event day and during the sub-period after the event. The result implies that the analysts recommendations are not influential or investors simply ignore the analysts recommendations.

Table 6.22: Stock return (%)- buy vs. hold recommendations

	Buy	Hold	Difference	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	-0.025	-0.098	0.073*	1.730	0.097
Event day	-0.018	-0.277	0.258	0.967	0.337
After event	-0.125	-0.077	-0.049	-0.750	0.457

notes: * significant at 10%

We further continue our investigation by examining the differences of mean daily return across a sub-period in each type of recommendations. By assuming that each group is independently distributed, we analyse the difference of mean daily return between groups across sub-periods using one-way ANOVA. The results in Table 6.23 show that F -value of 0.682 is not statistically significant at the 5% level. It means that daily stock return is equal across sub-periods and recommendations. The multiple mean comparison procedures using the LSD and Tukey's HSD give consistent results with the ANOVA results that there is no significant differences of stock return across different recommendations.

Table 6.23: ANOVA of daily return in participating companies

	Sum of Squares	df	Mean Square	F -value	p -value
Between groups	1.20	5	0.24	0.682	0.638
Within groups	56.03	159	0.35		
Total	57.23	164			

Therefore all results of statistical test of significance are consistent such that there is no significance difference of daily return between the two different recommendations. The insignificant differences of stock return between the recommendations implies that the analysts recommendations do not have new information that can influence investors expectations of future returns. As there is no new information in the analysts recommendations that investors can react to, there is no immediate reason for investors to trade, so significant change in prices is not observed. It implies that investors do not rate highly the analysts recommendation that even the favourable recommendations do not generate positive return.

6.5.3 Recommendations effects on trading volume

Table 6.24 shows the differences of mean daily turnover or trading volume between companies with buy and hold recommendation. In our earlier results shown in Table 6.10 we find that trading volume in the participating companies is significantly lower than in the control group in each sub-period. By comparing trading volume between the buy and

hold recommendations in the participating companies, we find in Table 6.24 that there is no significant difference of daily turnover between the buy and hold recommendations in each sub-period.

Table 6.24: Daily turnover (%) - buy vs. hold recommendations

	Buy	Hold	Difference	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	0.093	0.066	0.028	1.114	0.270
Event day	0.043	0.036	0.006	0.369	0.714
After event	0.064	0.066	-0.002	-0.806	0.932

By assuming each group of sub-period and each type of recommendations are randomly independently distributed, we perform ANOVA test and find that the *F*-value of 1.691 is not statistically significant at 5% level as shown in Table 6.25. It means that there is no difference in trading volume between the favourable and the less favourable recommendations and across sub-periods.

The results from the multiple mean comparison procedure of the LSD show that companies with the buy recommendations in the sub-period before the event has significantly higher trading volume than both recommendations on the event day. Our statistical tests give consistent results with the previous statistical tests mentioned earlier in Section 6.4.3. The significantly lower trading volume on the event day of the buy recommendations means that the favourable recommendations do not influence investors to trade more actively in the companies' shares recommended by the analysts. Similarly, the less favourable analysts recommendations do not influence traders to trade less actively in the companies' shares that received the recommendations.

Table 6.25: ANOVA of stock turnover in participating companies

	Sum of Squares	df	Mean Square	<i>F</i> -value	<i>p</i> -value
Between groups	0.058	5	0.012	1.691	0.140
Within groups	1.084	159	0.007		
Total	1.142	164			

The results imply that the analysts recommendations are not influential enough to influence investors to change their prior expectations, and therefore even the favourable recommendations are not able to generate higher trading volume. Nevertheless, stock turnover for companies with the buy recommendations is higher than companies with the hold recommendations on the event day.

6.5.4 Recommendations effects on bid-ask spread

In the earlier section, our analysis shows that bid-ask spread in the participating companies is higher than the control group in the sub-period before and after the event. Within the participating group, there is no significant change in the bid-ask spread before and after the event. This means that the cost of trading in the participating companies is still higher even after taking part in the incentive scheme of analysts coverage.

Table 6.26: Bid-ask spread (%) - buy vs. hold recommendations

	Buy	Hold	Difference	<i>t</i> -value	<i>p</i> -value
Before event	1.339	1.740	-0.401**	-2.145	0.037
Event day	1.432	1.683	-0.252	-0.450	0.655
After event	1.374	2.225	-0.851***	-3.357	0.001

notes: *** significant at 1%, ** significant at 5%

Further analysis in the companies participating in the incentive scheme shows that the bid-ask spread in the companies with buy recommendations are consistently lower than that in the companies with hold recommendations. As shown in Table 6.26, the differences of bid-ask spread between the buy and hold recommendations in the sub-period prior to the event and sub-period after the event are statistically significant from zero, while on the event day the difference of bid-ask spread is not significant. The significantly higher bid-ask spread observed in the hold companies means that the costs of trading in companies with less favourable recommendations is higher than the companies with favourable recommendations. This implies that companies with favourable recommendations have lower information asymmetry and adverse selection cost than companies with less favourable recommendations.

By assuming that the bid-ask spread is randomly and independently distributed, we continue our analysis by applying a one-way ANOVA test in order to determine whether the mean bid-ask spread between the groups across sub-periods of buy and hold recommendations is equal. Table 6.27 shows that the F -value of 1.599 is not statistically significant at the 5% level. It means that there is no significant difference of bid-ask spread between the groups across recommendations and sub-periods.

Table 6.27: ANOVA of bid-ask spread in participating companies

	Sum of Squares	df	Mean Square	F -value	p -value
Between groups	15.06	5	3.01	1.599	0.163
Within groups	299.66	159	1.88		
Total	314.73	164			

However, the results of multiple mean comparison procedure using the LSD shown in Table 6.28 reveal that the bid-ask spread in the companies with hold recommendations in the sub-period after the event is significantly higher than that of companies with buy recommendations. In other words, after the release of the recommendation news, companies with hold recommendations have the highest bid-ask spread and the differences of bid-ask spread between the buy recommendations are statistically significant at the 5% level.

Among companies with buy recommendations, the LSD procedure reveals that there is no significant change of bid-ask spread between the sub-periods. Similar results are also observed among companies with hold recommendations. It means that companies with the buy recommendations inherently have smaller bid-ask spread than companies with the hold recommendations. The inherently higher bid-ask spread in companies with the hold recommendations could be due to the lower trading volume in the hold companies as shown earlier in Table 6.24.

The insignificant decrease of bid-ask spread on the event day and in the sub-period after the event is an indication that the release of analysts recommendations do not have substantial effects in reducing the bid-ask spread in the companies recommended by the analysts. In other words, the analysts recommendations are not able to reduce adverse

Table 6.28: Multiple comparisons of bid-ask spread (%) between recommendations

Comparison procedure	(I)	(J)	(I-J)	Std. Error	<i>p</i> -value
LSD	AE (H)	BE (B)	0.886**	0.371	0.018
	AE (H)	BE (H)	0.485	0.381	0.204
	AE (H)	ED (B)	0.793**	0.371	0.034
	AE (H)	ED (H)	0.542	0.381	0.157
	AE (H)	AE (B)	0.851**	0.371	0.023

notes: BE= before event, ED= event day, AE= after event,

(B)= buy recommendation, (H)= hold recommendation,

** significant at 5% level

information among investors regardless of whether the recommendation is favourable or less favourable for the company. This reflects that there is no significant information content in the analysts recommendations which will influence an investors' decision.

In summary, the analysts' favourable recommendations do not have a significant impact on the trading of companies participating in the incentive scheme. The insignificant improvement in stock valuation, returns, trading volume or the bid-ask spread in the companies getting the favourable recommendations means that the recommendations are not highly rated by investors. Similarly, the analysts less favourable recommendations do not have a severe impact on companies, except in the measure of bid-ask spread. Initially, in the earlier analysis we find that the analysts reports do not have a significant impact. Similarly, the analysts recommendations that are accompanying the reports are not highly rated by investors.

6.5.5 Recommendations effects on illiquidity measures

Previously in Section 6.4.5 we have showed that the mean illiquidity measure λ_a in the participating group is significantly higher than the control group. It means that the participating companies are less liquid than companies in the control group. In the next analysis, we compare the illiquidity measure according to the analysts recommendations between the buy and hold companies across all sub-periods.

The results in Table 6.29 show that there is no significant difference of λ_a between different types of recommendations for each sub-period. It means that companies receiving favourable recommendations do not show any significant impact on liquidity from companies that received less favourable recommendations. Although the differences of λ_a is not significant from zero, the illiquidity measure in companies with the buy recommendations is lower than the hold recommendations in the sub-period after the event. This is consistent with the earlier result in Section 6.5.4 in which the bid-ask spread in the buy recommendations is significantly lower than the hold recommendations in the sub-period after the event.

Table 6.29: Illiquidity measure, λ_a - buy vs. hold recommendations

	Buy	Hold	Difference	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	1.685	2.732	-1.047	-1.078	0.286
Event day	1.567	0.853	0.714	0.779	0.440
After event	1.659	3.010	-1.351	-1.315	0.194

Our analysis is continued with a one-way ANOVA test in which we assume that λ_a for each sub-period and each type of recommendation is randomly and independently distributed. The ANOVA test gives *F*-value and *p*-value of 1.307 and 0.264 respectively, which means that there is no group that has significantly higher λ_a than the others. The ANOVA test confirms that there is no statistical significant difference of illiquidity measure between each type of recommendations.

Essentially, there is no clear evidence that the illiquidity measure, λ_a , manages to show that the analysts favourable recommendations have significant effects in reducing illiquidity on the event day. The results reveal that the analysts recommendations are not so influential and informative that they could affect the illiquidity measure.

We have also shown in Section 6.4.5 that our proposed illiquidity measure λ_b in the participating group is significantly higher than the control group for the sub-period before the event. Our next investigation is to compare the alternative illiquidity measure λ_b according to the type of analysts recommendations. Table 6.30 compares the mean illiquidity measure between the buy and hold companies across sub-periods. The results

are consistent in which there is a significant difference of λ_b between the buy and hold companies at the 10% significant level in the sub-period before the event. It means that before the event companies with the buy recommendations are more liquid than companies with the hold recommendations. However, after the event the significant difference of λ_b disappears. This implies that the analysts favourable recommendations have no significant impact on liquidity.

The results using λ_b as shown in Table 6.30 is slightly different from the results using λ_a as shown in Table 6.29. Nevertheless, the pattern of magnitude of illiquidity measures is similar such that companies with the buy recommendations are more liquid than companies with the hold recommendations.

Table 6.30: Alternative illiquidity measures, λ_b - buy vs. hold recommendations

	Buy	Hold	Difference	<i>t</i> -value	<i>p</i> -value (2-tailed)
Before event	166	375	-209*	-1.851	0.070
Event day	142	111	31	0.308	0.760
After event	181	353	-172	-1.350	0.183

notes: * significant at 10%

Similar with the previous analysis, by assuming that each group is randomly and independently distributed, we then apply the one-way ANOVA test which gives *F*-value of 1.898 and *p*-value of 0.097. It means that the alternative illiquidity measure between the groups across recommendations and sub-periods is statistically significant at the 10% level. The result is not consistent with the earlier one using λ_a . This means that one of the groups in the buy or hold recommendations has significantly higher or lower λ_b than the rest of the groups.

The multiple mean comparison procedures using the LSD procedure confirms within the hold companies that the difference of λ_b between sub-periods is statistically significant at the 5% level. This is because λ_b for the hold recommendations on the event day is very low. Since the calculation of event day illiquidity measure is biased when the company is not traded, Amihud (2002) suggests the using of more observation points in the calculation of illiquidity measure. Accordingly, the calculation of λ_a and λ_b on

the event day is not very useful when the companies are not traded on the event day. Therefore, the using of single observation to calculate illiquidity measures on the event day does not reveal comparable results.

Nevertheless, we have used Amihud (2002)'s illiquidity measure, λ_a and our own alternative illiquidity measure, λ_b . Both measures of illiquidity using the sub-period 120-day before and 120-day after the event reveal similar results in terms of patterns of magnitude of illiquidity measures. Although the participating group has higher illiquidity measures than the control group, the differences within the group itself are not significant from zero. The difference of illiquidity measures between the sub-period 120-day before the event and after the event within each group is also not significant from zero.

In general, both illiquidity measures show the same pattern of results, and therefore the proposed illiquidity measure λ_b could still be used. Basically, both illiquidity measures reveal that the participating group is less liquid than the control group even though the difference is not statistically significant from zero in most of the tests. Despite the difference in composition of companies between the participating companies and the control group, the difference between the two groups is still comparable.

The insignificant difference of both illiquidity measures between the sub-period before and after the event is an indication that the analysts' initial reports are not influential and informative such that the reports do not have significant effects in reducing the risk of trading or increasing the ease of trading. This could be due to the content of the reports which is not highly influential nor important to investors, as such there is no impact on investors' prior belief and expectation which could reduce the risk. Accordingly, the analysts recommendations do not generate and influence investors to trade more vigorously as there is no need for investors to reshuffle their investment portfolio.

The result implies that the analysts recommendations that are accompanying the analysts reports are also not influential nor informative to investors so there is no significant change between the favourable and less favourable recommendations. As there is no change in investors' expectation upon the release of the analysts recommendations, even the favourable recommendations are not able to attract investors to buy more shares or increase their trading.

6.5.6 Summary of effects of recommendations

In summary, the study has examined the effects of analysts recommendations that are accompanying the financial analysts' initial reports. The same variables previously used in Section 6.4.6 are examined and analysed. The variables are stock valuation, returns, trading volume, bid-ask spread and the illiquidity measures. Table 6.31 presents the summary of the variables that have been used and analysed from Section 6.5.1 to 6.5.5. The sub-period 'Before' and 'After' is 120-trading day before and after the event respectively, while 'Event' is the event day itself.

Table 6.31: Summary of the effects of analysts recommendations

Variable	Buy			Hold		
	Before	Event	After	Before	Event	After
1. Stock valuation (RM mil)	266	259	245	324	297	285
2. Stock return (%)	-0.025	-0.018	-0.125	-0.098	-0.277	-0.077
3. Stock turnover (%)	0.093	0.043	0.064	0.066	0.036	0.066
4. Bid-ask spread (%)	1.339	1.432	1.374	1.740	1.683	2.225
5. Illiquidity measure, λ_a (x1000)	1.685	1.567	1.659	2.732	0.853	3.010
6. Illiquidity measure, λ_b	166	142	182	375	111	353

In general, Table 6.31 shows that there is no significant difference of measurements in each variable between the buy and hold recommendations groups after the release of analysts recommendations except the bid-ask spread. It is the only variable that shows a significant difference between the buy and hold recommendations. This means that the buy recommendations have greater influence than the hold recommendations as reflected by a lower bid-ask spread in the buy recommendations.

However, in most of the statistical tests that have been performed, the analysts favourable recommendations are no different from the less favourable recommendations. It implies that the buy recommendations are not sufficiently informative and influential to persuade and convince investors to increase their demand for shares and eventually buy more shares of the companies that are recommended by the analysts. Similarly, the less favourable, the hold recommendations are not informative and influential enough to

convince investors to reduce the demand for shares. In particular, the study finds that there is no concrete and clear evidence that the analysts recommendations have any significant impact on the companies recommended by the analysts. We will further discuss the implication of the results in the next chapter.

6.6 Results of event study

The event study methodology has become the standard method of measuring security price reaction to corporate announcements or a financial related event. In practice, event studies have been used for two major reasons. Firstly, it is used to test the null hypothesis that the market efficiently incorporates information and secondly, under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of the shareholders of the company.

The event study approach provides an ideal tool for examining the information content of an event. The release of the analysts' initial reports is an important event in the study because investors are expecting new information from the reports as well as the analysis and insights brought forward by the analysts that is not yet known in the market. The release of the reports, therefore should cause significant changes in stock price.

6.6.1 Event study: Market model

Parameter estimation

Previously in Section 5.4.3, some common models used in the event study are presented. As mentioned before, the study employs the market model which is defined as follows,

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t}. \quad (6.3)$$

where $r_{i,t} = \log(P_{i,t}/P_{i,t-1})$ and $r_{m,t} = \log(P_{m,t}/P_{m,t-1})$. P_i is the stock price of company i and P_m is the market price represented by the value-weighted Composite Index of the Kuala Lumpur Stock Exchange (KLCI), while α_i and β_i are the parameter estimates and $\varepsilon_{i,t}$ is the error term. The estimation period is based on day -220 to -121 or 100 trading days return.

Table 6.32: Estimated parameter for the participating and control group

Parameter	Mean	Median	Std. Dev.	Min	Max
<u>A. Participating</u>					
$\hat{\alpha}$	-0.0006	-0.0005	0.0014	-0.0042	0.0017
$\hat{\beta}$	0.565	0.570	0.478	-0.674	1.807
<u>B. Control</u>					
$\hat{\alpha}$	-0.0007	-0.0006	0.0013	-0.0039	0.0015
$\hat{\beta}$	0.859	0.892	0.532	-0.681	2.390

Using the OLS method the estimated α_i and β_i for the 55 companies in the participating group and 50 companies in the control group are shown in Table 6.32 using returns from day -220 to -121 . In Panel A, $\hat{\alpha}$ is significant from zero at the 10% level in 4 out of 55 companies, while $\hat{\beta}$ is significant from zero in 35 out of 55 companies. In Panel B, the number of significant $\hat{\alpha}$ is 5 out of 50 companies, while the number of significant $\hat{\beta}$ is 43 out of 50 companies. The magnitude of β estimates in the control group is also higher than the participating group.

The difference of magnitude and ratio of the significant parameter estimates between the participating companies and the control group could be due to the difference in company size between the participating companies and the control group. The higher magnitude of $\hat{\beta}$ in the control group means that share prices in the control group are more volatile and sensitive to the market than that of the participating group. In spite of the differences, the empirical results shown in the following sections are still comparable.

Parameter adjustment to illiquid stocks

We have also mentioned earlier in Section 5.3.2 that Scholes and Williams (1977) have proposed a method to adjust the estimated parameters for stocks that are less frequently traded. Section 5.3.2 reveals that based on the non-trading days ratio during the period, the frequency of trading in the participating groups is moderate, thus most of the companies are traded in most of the days during the period under study. There are only a few days that the companies are not traded. In the participating group, the mean non-

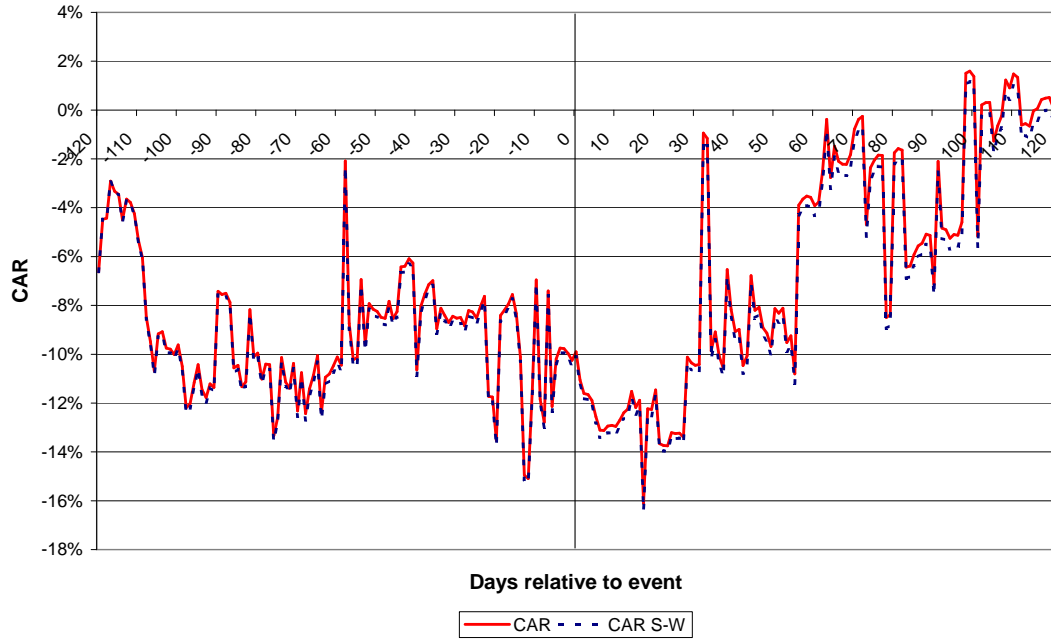


Figure 6.1: SAB - Actual vs. Adjusted CAR (SW)

trading day ratio is 0.10, or one non-trading day in ten trading days, with the highest ratio of a non-trading day of 0.33 in which four companies have a non-trading day ratio of more than 0.30. On the other hand, the non-trading day ratio in the control group is lower than the participating group. The mean non-trading day ratio in the control group is 0.02 and the highest ratio is less than 0.20. This means that companies in the control group are traded more frequently than companies in the participating group.

Since there are more occurrences of higher non-trading ratio in the participating group, only stocks with high non-trading ratio in the participating group are subject to estimation adjustment. The adjusted estimations are based on Equation (5.1) and (5.2) using the procedure suggested by Scholes and Williams (1977) mentioned in Section 5.3.2. The adjusted parameters estimated are then used to calculate CAR for each company. The cumulative abnormal return (CAR) from day -120 to day 120 calculated using the adjusted beta is then compared with the actual CAR.

We find that the mean absolute difference between the actual CAR and the adjusted CAR is small. The mean absolute difference is 0.28%, 0.59%, 0.88% and 1.21% for the four respective companies that have a high non-trading day ratio of more than 0.30. For

example, Figure 6.1 exhibits the difference of CAR in a company called SAB between the CAR based on the actual estimates and the CAR based on the adjusted estimates as proposed by Scholes and Williams (1977). It is obvious from Figure 6.1 that the difference of CAR as a result from the estimation adjustment is very small and insignificant that the difference could be ignored. Consequently, the study employs the actual estimates based on the market model in Equation (6.3) and the CAR is calculated without any adjustment.

This result is consistent with Campbell et al. (1997) who argue that in order for the non-trading stocks to have an effect on autocorrelation of daily returns, the non-trading probability has to be extremely high. They have proved that if a security has mean and variance of daily returns of 0.5% and 2.5% respectively, it would require a non-trading probability of 97.2% to attain an induce autocorrelation of -0.037% in individual security returns. Brown and Warner (1985) have also tested the measurement of abnormal return using different models. They reveal that the results from the model adjusted for non-frequently traded stocks following the Scholes and Williams (1977)'s procedure are no different from the results from the model using the OLS method. As such, there is no substantial effect on autocorrelation of daily returns caused by non-trading stocks.

Examining the confounding events

Previously in Section 5.4.2, the effects of other financial related events or confounding effects has been discussed. The presence of other important events within the event window could cause doubts about the validity of the empirical results and the conclusions drawn. We have checked from the Bursa Malaysia's website the presence of any other event that could have affected the findings and results of the study. We find that there is one important event that occurs before and after the event. The particular event is the announcement of the quarterly results from the company. On average we find that the quarterly announcements occur 44 days prior to the release of the analysts' initial reports or 42 days after the release of the reports. It means that there is one important event that occurs during approximately 30 trading days before and after the release of the analysts reports.

Further examination shows that there is only one company that has announced their quarterly results one day before the event. There is also one company that has announced their results two days after the event. It means these two companies have another important event that is very close to the release day of analysts' initial reports. Therefore, we find that the confounding effects are very minimal during the event window of 30 trading days before and 30 trading days after the event. Following the recommendation from McWilliams and Siegel (1997) to investigate companies that experience other relevant events during the event window, we can verify that the most important event during the event window $[-30,30]$ was the release of the financial analysts' reports of the participating companies.

6.6.2 Abnormal return: participating companies and control group

The analysis is continued with the event study approach discussed in Section 5.4.2. Based on the estimation from the market model using Equation 6.3, the CAR in each company is aggregated and plotted. The event window is varied in order to investigate the different patterns in CAR. Figure 6.2 presents the movements of CAR using event window day -120 to 120 for the participating companies and the control group. The vertical line is the event day, i.e day 0. The calculation of the CAR starts at day -120 or 120 days before the event date or nearly six months before the release date of the analysts' initial reports up until 120 trading days after the event date. The study uses a longer event window so that the effects of information leaking or insider trading can be detected. Moreover, to our understanding, there is no previous study on the effects of analysts coverage in the Malaysian stock market and therefore the effects of the event are uncertain.

Focusing on the release day of the analysts' initial reports, the mean abnormal return for the participating group on the event day using the market model is -0.092% . The standard error of the one-day participating group mean abnormal return is 0.244% . Based on t -test statistics described in Section 5.4.4, the statistic -0.379 is not statistically different from zero. The standardised t -test statistics for the participating group on day $t=0$ is -0.423 , while the rank test statistics is -0.427 . It means that all the test statistics

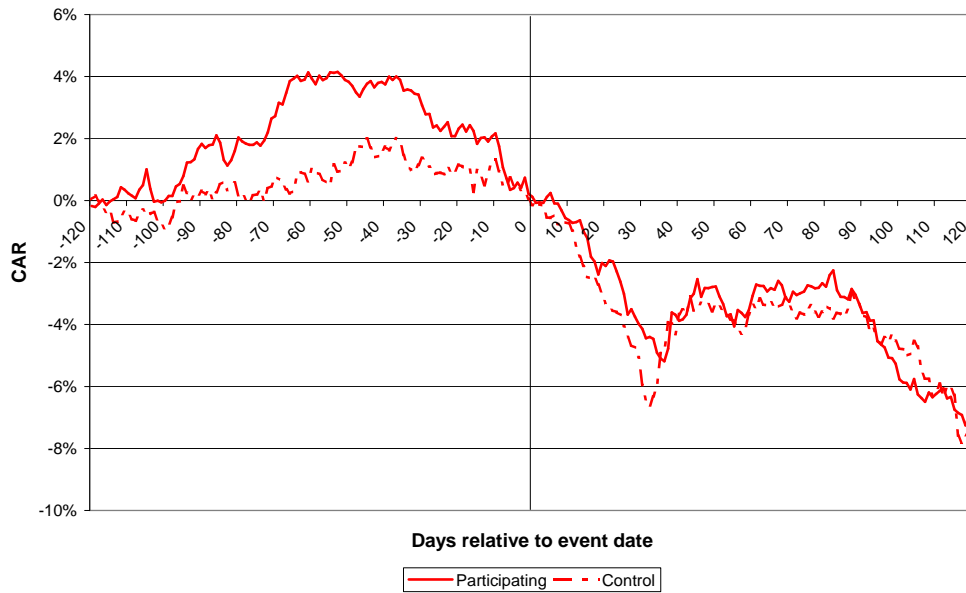


Figure 6.2: CAR market model - participating vs. control

for the abnormal return on the event day are not significantly different from zero and therefore the null hypothesis that the event has no impact on the participating companies on the event day is not rejected.

The same thing happens to the control group. On the event day, $t=0$, the mean abnormal return for the control group is -0.195% and with standard error of 0.217% , the t -test statistics of -0.902 is not significantly different from zero. The standardised t -test statistics is -0.882 , while the rank test is -1.104 . Similarly, all the test statistics are not significantly different from zero and therefore the null hypothesis that the event has no impact on the control group is not rejected. It is an indication that the release of the financial analysts' initial reports is not an important or value relevant event because there is no significant abnormal return that can be observed on the event day.

Although Fama and French (1996a) argue that β alone cannot explain expected return, Eckbo and Norli (2005) suggest that β less than one partially explains why the portfolio raw return grows at a slower rate than the equal-weighted NASDAQ market itself between 1973 to 2002. Similarly, as shown in Table 6.32, the mean β is less than one which may also partially explain the slower rate of growth of the portfolio raw return. Figure 6.2

shows that both CARs, the participating companies and the control group, during the event window $[-120, 120]$ are drifting in the same direction.

The pattern of CARs is almost identical with each other, despite a higher magnitude of CAR in the participating companies. The CAR for the participating companies reaches the highest point of 4% more than 60 days before the event day; however, the positive CAR is not sustainable as it drifts downwards and upwards throughout the event window. The CAR for the control group follows the same track although the magnitude is smaller. The positive series of CARs in the participating group are statistically different from zero between day -69 to -36 . On the other hand, the positive series of CARs before the event day for the control group are not statistically different from zero. After the event day, the negative series of CARs in the participating group are statistically significant from zero from day 105 onwards, while the negative series of CARs for the control group are statistically significant from zero between day 26 to 36 and from day 105 onwards.

The CARs between the participating companies and the control group is compared following a similar method based on Liu et al. (1990).¹ The difference of CARs between the participating companies and the control group is statistically significant at 10% level only on day -66 and -65 , while on the rest of the days in the event window $[-120, 120]$, the differences are not statistically significant from zero. It means that the null hypothesis that the CAR for the participating group and the control group are equal cannot be rejected.

At first glance, the building-up of positive CARs in the participating group many days prior to the event day may suggest that there is an occurrence of leaking of information or insider trading in the participating companies prior to the event. However, the building up of positive CARs prior to the event day shown in Figure 6.2 does not provide strong

¹The t -statistic for testing the null hypothesis that the CAR for the participating group and the control group are equal is calculated as follows,

$$t = \frac{\overline{CAR_p} - \overline{CAR_c}}{[\frac{S_p^2}{N_p} + \frac{S_c^2}{N_c}]^{1/2}},$$

where $\overline{CAR_p}$ and $\overline{CAR_c}$ are the CAR for the participating companies and the control group, N_p and N_c are the number of CAR of the participating companies and the control group, and S_p^2 and S_c^2 are the variance of the CAR of the participating companies and the control group, respectively.

evidence that there is any new information which could be due to the release of financial analysts' reports. It is because a similar pattern of CAR is also observed in the control group despite a smaller magnitude. The difference of CAR between the participating companies and the control group is not statistically significant in most days in the even windows $[-120, 120]$ either.

Furthermore, as we have explained in the earlier section there were other important events that had occurred during the longer event window $[-120, 120]$ such as the release of quarterly results for most of the participating companies and the control group during the period of more than 30 days before the event day. The positive CAR for the participating companies is not sustainable enough that the CAR starts to reverse and drift downwards and upwards from day -30 onwards. The pattern of CAR in the participating companies is not similar with Figure 4.2 or Figure 4.3 that we showed earlier in Section 4.6.1. The literature shows that the pattern of CARs such as depicted in Figure 4.2 or Figure 4.3 is a reflection that there is a significant event that had occurred around day 0. In order to verify the results, a shorter event window will be used.

We replicate the analysis using a shorter event window $[-30, 30]$. This is because we have shown earlier that the event window $[-30, 30]$ is almost free from other events that may affect the empirical results. The movement of CARs for the participating companies and the control group in the event window $[-30, 30]$ are displayed in Figure 6.3. We find that the pattern of CARs in the event window $[-30, 30]$ is different from the pattern of CARs in the event window $[-120, 120]$. In contrast, the plotted graph of CAR shows that there is no sign of building-up of positive CAR prior to the event day. The negative CARs for the participating group are statistically significant from day -8 onwards, while in the control group the negative CARs are statistically significant from day 12 onwards.

Similar with the results of event window $[-120, 120]$, we find that the pattern of CARs in the participating and control group is closed with each other despite the differences in the magnitude of CAR. In contrast, the magnitude of CAR in the participating group is lower than the control group in the entire event window $[-30, 30]$. However, the t -test statistics show that the difference of CARs between the participating companies and the control group is statistically significant only on day -29 , while on the other days in the

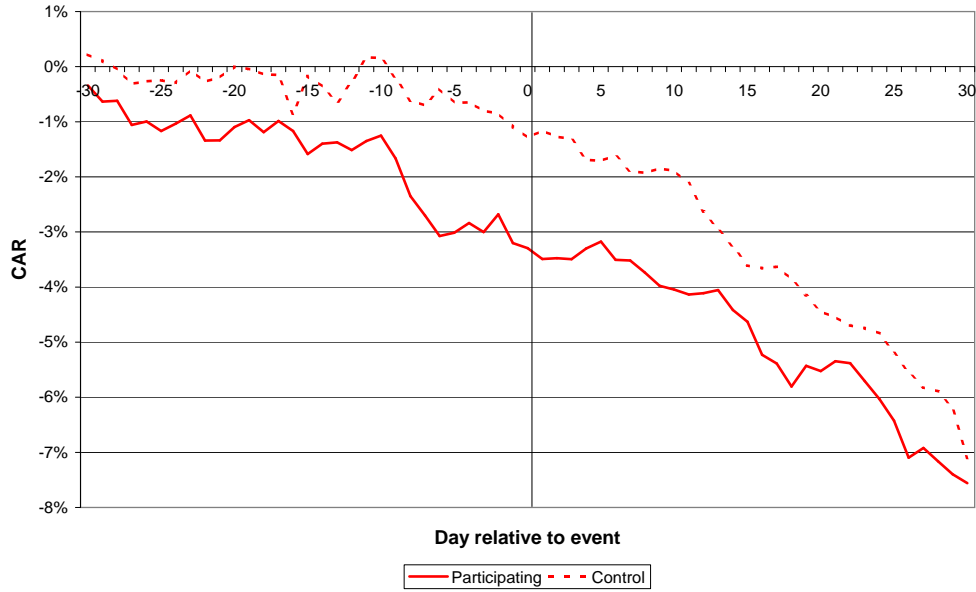


Figure 6.3: CAR market model - participating vs. control (shorter window)

$[-30, 30]$ window, the differences are not statistically significant. This result confirms that the null hypothesis that the CAR between the participating companies and the control group are equal cannot be rejected.

The non existence of positive CAR for the participating companies prior to the event day in the event window $[-30, 30]$ means that there is no evidence of leaking of information or insider trading prior to the event day. There is also no positive CAR during window $[-1, 2]$ which is very closed to the event day. The CAR for the participating companies in the event window $[-1, 2]$ is -0.794% (t -value= -1.627) which is not statistically different from zero. This result further implies that the release of the financial analysts' reports is not really an important event.

The building-up of positive CAR in the participating group as well as the control group that have been observed in the event window $[-120, 120]$ based on the market model is an indication that there are other important and informative events that happened between day -69 to day -36 . This is consistent with the verification of other major events that took place during the longer event window that we have mentioned earlier. This means that the other events have also affected the CAR during the event window.

Table 6.33: Market model abnormal return (AR) and CAR

Day	AR (P)	AR (C)	CAR (P)	CAR (C)	CAR Diff.
-30	-0.341%	0.218%	-0.341%	0.218%	-0.559%*
-20	0.240%	0.196%	-1.097%	0.000%	-1.097%
-10	0.100%	-0.003%	-1.251%	0.161%	-1.412%
-9	-0.415%*	-0.369%*	-1.666%	-0.207%	-1.459%
-8	-0.681%***	-0.412%***	-2.348%**	-0.620%	-1.728%
-7	-0.352%	-0.083%	-2.699%**	-0.703%	-1.996%
-6	-0.376%	0.298%	-3.075%**	-0.405%	-2.670%
-5	0.061%	-0.250%	-3.014%**	-0.656%	-2.358%
-4	0.175%	0.008%	-2.839%**	-0.648%	-2.191%
-3	-0.165%	-0.154%	-3.003%**	-0.802%	-2.202%
-2	0.322%	-0.049%	-2.681%**	-0.850%	-1.831%
-1	-0.520%**	-0.241%	-3.201%**	-1.092%	-2.109%
0	-0.092%	-0.195%	-3.293%**	-1.287%	-2.006%
1	-0.198%	0.125%	-3.491%**	-1.162%	-2.330%
2	0.016%	-0.107%	-3.475%**	-1.268%	-2.207%
3	-0.018%	-0.047%	-3.493%**	-1.316%	-2.178%
4	0.193%	-0.375%*	-3.300%**	-1.691%	-1.609%
5	0.126%	-0.018%	-3.174%**	-1.708%	-1.465%
6	-0.333%	0.090%	-3.507%**	-1.619%	-1.888%
7	-0.010%	-0.281%	-3.517%**	-1.899%	-1.618%
8	-0.218%	-0.027%	-3.735%**	-1.926%	-1.809%
9	-0.242%	0.077%	-3.977%**	-1.849%	-2.128%
10	-0.069%	-0.042%	-4.046%**	-1.891%	-2.155%
20	-0.094%	-0.295%	-5.524%***	-4.446%***	-1.079%
30	-0.161%	-0.902%	-7.557%***	-7.104%***	-0.454%

notes: (P) - participating, (C) - control,

*** significant at 1%, ** significant at 5%, * significant at 10% level

In analysing the movement of CAR, according to Bodie et al. (2005), if there is no abnormal return observed on days before the event it means that the market is efficient such that insider trading rules were perfectly obeyed and perfectly enforced because no special firm-specific information will be available before a public announcement. If the market is anticipating that an event is important, then a building-up of the CAR prior to the event is expected to take place. On the other hand, if the market is efficient and

there is new information arising from a particular event, then we should observe a clean jump of CAR only on the event day instead of a building-up of the CAR prior to the event day.

However, in the study we do not observe a clean jump in the stock price on the release day of the analysts reports either in the longer or shorter event window. A growing pattern of CAR prior to the release day of the analysts reports in the shorter event window is also not clearly observed. Instead of a clean jump, we only observed price drift. In addition, a similar pattern of CAR is also observed in the control group. Moreover, the difference of CAR between the participating companies and the control group is not statistically significant in many days in the event window.

The negative CARs in the participating companies and the control group as shown in Table 6.33 and the pattern of CARs movement in the participating group do not have any resemblance with Figure 4.2 or Figure 4.3 mentioned earlier in the literature review in Section 4.6.1. Furthermore, the difference of CARs between the participating companies and the control group is not statistically significant in most of the days either in the event window $[-120, 120]$ or $[-30, 30]$. It means that the abnormal returns in the participating companies are no different from the control group.

Therefore we conclude that there is no sufficient evidence to suggest that the release of analysts' initial reports has any significant informative event that could affect returns. The examples of cumulative abnormal returns using the market model in the event window $[-120, 120]$ of some companies that are participating in the incentive scheme are shown in Appendix A.4. Table A.1 in Appendix A.6 shows the test of significance of CAR based on the market model for the participating companies during event window $[-30, 30]$. The tests statistics used are t -test statistics, standardised t -test statistics and rank statistics. Despite the negative CARs, most of the tests are statistically significant.

6.6.3 Event study: Market-adjusted return model

We replicate the event study method by using the market-adjusted return model. Basically, the abnormal return is calculated as the observed stock return less the market return as shown earlier in Section 5.4.3. The abnormal return using market-adjusted

return model is as follows,

$$\varepsilon_{i,t} = r_{i,t} - r_{m,t} \quad (6.4)$$

where $r_{i,t}$ is the observed stock return and $r_{m,t}$ is the observed market return on day t using the KLCI index as the market return. The CAR observed in the event window is compared with the ones in the estimation period.

Similar with the market model, we begin by focusing on the release day of the analysts' initial reports. The mean abnormal return for the participating group on the event day using the market-adjusted return model is -0.178% . The standard error of the one-day participating group mean abnormal return is 0.256% , and therefore it gives the t -test statistics of -0.694 . The result is the same with the one using the market model in which the null hypothesis is not rejected. It means that the event has no significant impact on the participating group on the event day. The standardised t -test statistics of the abnormal return on the event day $t=0$ is -0.763 , while the rank test statistics is -0.240 , which means that all the test statistics on the event day are not significantly different from zero. Therefore, the release day of the financial analysts' reports does not contribute to positive returns based on the market-adjusted return model.

As for the control group, the event day mean abnormal return using the market-adjusted return model is -0.298% , and with a standard error of 0.220% , it leads to the t -test statistics equal to -1.354 . Similarly, the null hypothesis that the event has no impact on the control group is not rejected at the 5% significant level. It is an indication that the release of the analysts' initial reports is not an important or value relevant event because there is no significant abnormal return observed on the event day using two models of event study.

Figure 6.4 compares the CARs between the participating companies and the control group based on the market-adjusted return model using the longer event window $[-120, 120]$. We find that both CARs in the participating companies and the control group are moving downtrend and the negative CARs are statistically significant from zero in most days in the event window. The pattern of both CARs are very similar and closer with each other, hence the difference of CARs between the participating companies and the control group is not statistically significant in the entire event window. Even

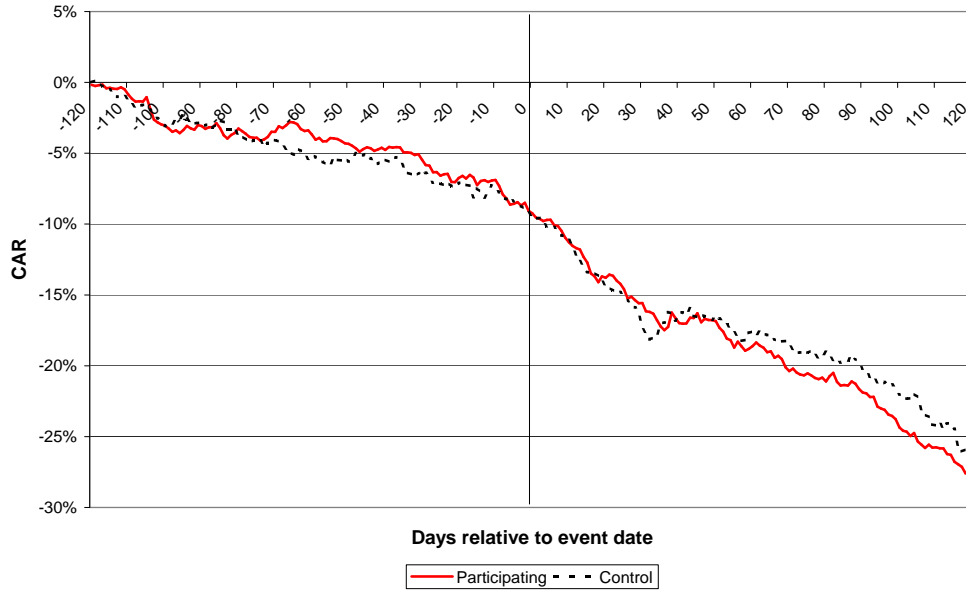


Figure 6.4: CAR market-adjusted model - participating vs. control

though the negative CARs in each group of companies are statistically significant, the downtrend of CARs in both group does not show evidence that there is a growing build-up of positive CARs. It reflects that there is no evidence of leaking of information or insider trading prior to the event day. Furthermore, we do not observe a significant price jump on the event day or a day after the release of the analysts' initial reports. Therefore, there is no evidence that the release of the analysts' initial reports is an informative and important event.

We replicate the analysis using a shorter event window $[-30, 30]$. We find that the pattern of CARs is of no different from the one using a longer event window as shown in Figure 6.5. There is also no clear price jump upon the event date or a growing build-up of positive CARs prior to the event as shown in the literature review (e.g. Figure 4.2 and Figure 4.3). As expected, the difference of CARs between the participating companies and the control group is also not statistically significant from zero in most of the days in the entire window. It means that the null hypothesis that the CARs between the participating companies and the control group are equal cannot be rejected.

Accordingly, the model of abnormal return using the market-adjusted return model

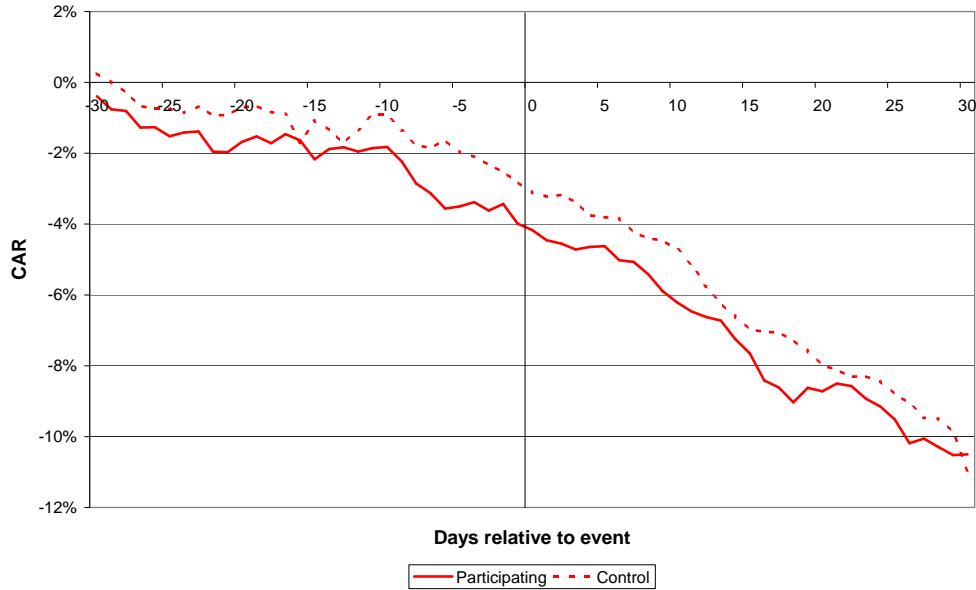


Figure 6.5: CAR market-adjusted model - participating vs. control (shorter window)

indicates that there is not enough evidence that the release of analysts' initial reports is an informative and financially related event. Although we have verified earlier that the release of analysts' initial reports is the only important event during the event window $[-30, 30]$ for most companies in the participating group, the evidence from the market-adjusted abnormal return model does not support that it is an important event that would contribute to positive CARs. As such, the evidence suggests that the information leaking or insider trading prior to the event is not supported.

In summary, we find that there is no clear evidence that the release of the analysts' initial reports is an important, informative and value related event which basically means it is a non-event day. Initially it appears that there is a tendency of leaking of information or insider trading prior to the event day as shown by the building-up of positive CAR in the event window $[-120, 120]$ based on the market model. However, the test statistics show that the difference of CARs between the participating companies and the control group are not statistically significant using two models of event study. Further evidence using a shorter event window $[-30, 30]$ based on the two models of event study also do not reject the null hypotheses that the CARs for the participating companies and the

control group are equal.

As the shorter event window has been checked and verified, there are no other major events that could have confounding effects that had occurred in the same event window, so the significantly positive CAR of market model prior to the event day in the longer event window $[-120, 120]$ could be due the effects of other events. Therefore the hypothesis that there is a leakage of information or insider trading prior to the event is not supported. Since the hypothesis that the leaking of information or insider trading prior to the event day is not supported, it means that the market is efficient. However, if the market is efficient, then there will be a significant impact upon the event day, otherwise the event is not really an event. Using two models of event study, we do not find enough evidence that there is any significant impact on the event day or a day after. It means that the release of analysts' initial reports is not really an important nor an informative event.

Although the pattern of CAR using a longer event window $[-120, 120]$ based on the market model does not match with the one based on the market-adjusted return model, the significance tests on the event day reveal the same results, i.e. all the test statistics of the abnormal return on the event day is not significant using both models. Furthermore, the test statistics show that the difference of CARs between the participating companies and the control group are not statistically significant from zero. In addition, the shorter event window $[-30, 30]$ reveals a similar pattern of CARs between the market model and market-adjusted return model. This means that the results of models of event study we used are comparable.

The CAR of the control group is also comparable with the participating group despite the difference in the composition of companies in each group. As there is no significant impact observed, there is no conclusive evidence that the release of analysts reports is a significant event nor that there is any new information content in the analysts' initial reports. Table A.2 in Appendix A.7 shows the test of significance of CAR based on the market-adjusted return model in the event window $[-30, 30]$ for the participating companies using t -test statistics, standardised t -test statistics and rank statistics.

6.6.4 Analysts recommendations

Market model

As there is no clear evidence that the release of analysts' initial reports have a significant impact on companies participating in the incentive scheme, we further examine the participating companies by breaking the group into their respective recommendations given by the analysts. Out of 55 companies in the participating group, 29 companies received buy recommendations and 26 hold recommendations. We compare the CAR between groups of companies with buy and hold recommendations where the control group remains unchanged as the reference group.

Similar with the previous results, the abnormal returns on the event day for the buy recommendations is 0.112% (t -test= 0.381), while the abnormal return for the hold recommendations is -0.320% (t -test= -0.782). Both statistics are not statistically different from zero. It means that the abnormal returns on the event day for both the buy and hold recommendations are not significant, which is an indication that the analyst recommendation is not an influential event. Figure 6.6 shows the pattern of CARs between the buy and hold recommendations with the control group as the reference. The CAR is calculated using the event window [-120,120] based on the market model as in Equation (5.13).

Among the three groups, the magnitude of CAR in the buy recommendations' group is the highest, and the hold recommendations' group is the lowest. The buy recommendations' group has statistically significant positive CARs between day -94 to 14. On the other hand, the hold recommendations' group has statistically significant negative CARs for most of the days after the event day. The difference of CARs between the buy and hold recommendations is compared using the method we mentioned earlier in Section 6.6.2. The differences are statistically significant from zero in most of the window from day -108 to day 85. It means that the abnormal returns in the buy recommendations' group are significantly higher than the hold recommendations group.

Although there seems like a building-up of positive CARs nearly 100 trading days before the event day in the buy recommendation' group, we have shown earlier that there

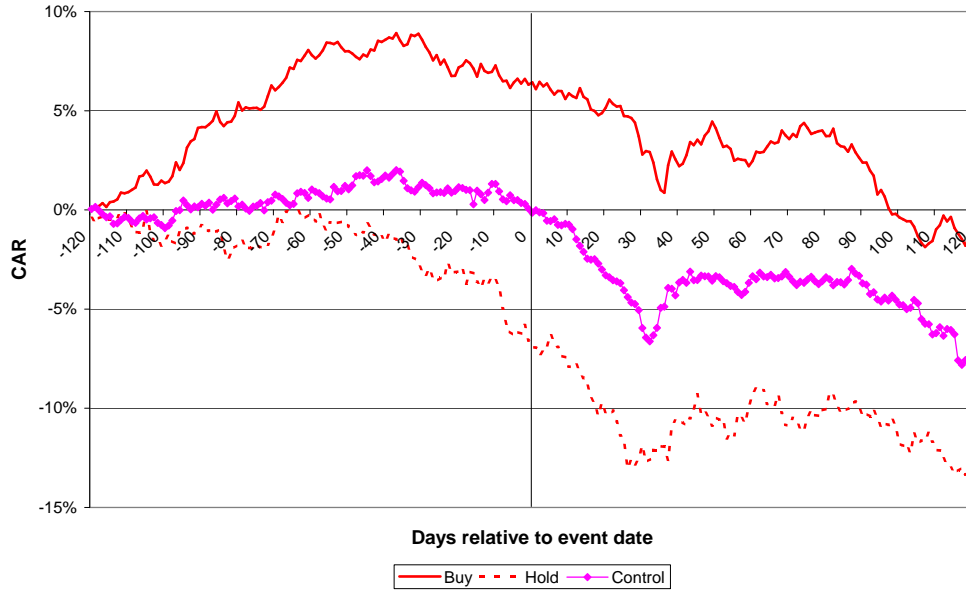


Figure 6.6: CAR market model - buy, hold & control group

is no conclusive evidence that there is any leakage of the recommendations or insider trading prior to the event that could contribute to the positive CARs. This is because there are other important events that had occurred during the event window more than 30 days before the day such as the release of the quarterly results. A good quarterly results in the buy recommendations' group might contribute to the positive CARs. Moreover, the positive CARs in the buy recommendations' group start to reverse from day -30 onwards. It means that the positive CAR is not sustainable enough that it could not establish a significant link with the arrival of new information in the analysts reports.

We further replicate our investigation and examine the movement of CARs for the buy and hold recommendations using a shorter event window $[-30, 30]$ based on the market model of abnormal return. The shorter event window $[-30, 30]$ shows a different pattern of CARs for all groups. In contrast, the magnitude of CAR in companies with buy recommendations is no longer substantially bigger than the hold recommendations or the control group. In fact, there is no clear pattern that one CAR is superior to the others as shown in Figure 6.7.

The results show that the negative CARs in both the buy and hold recommendations

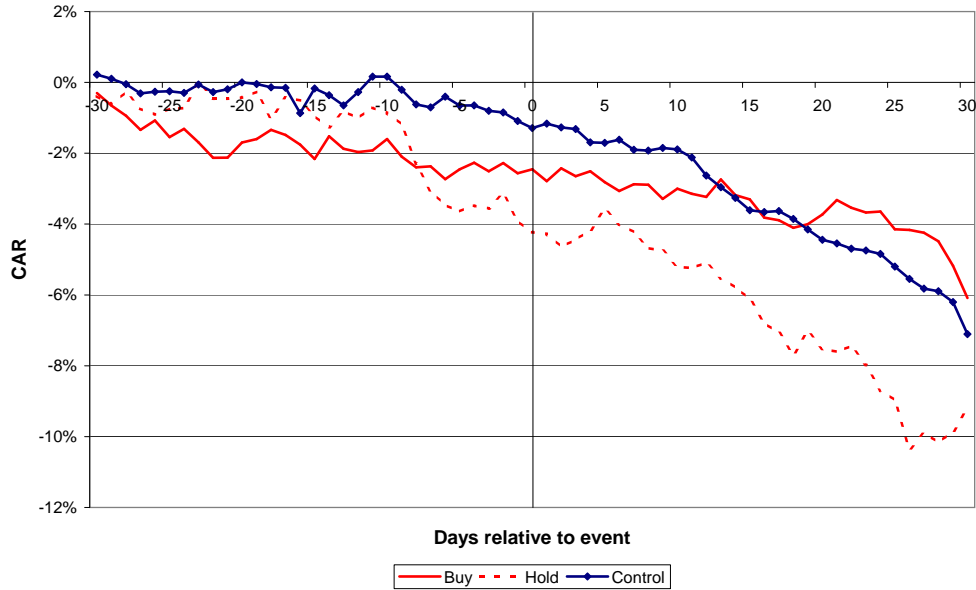


Figure 6.7: CAR market model - buy, hold & control group (shorter window)

are statistically significant for most of the days after the event day. As shown in Figure 6.7, despite the negative CAR, companies with buy recommendations have higher CAR for most of the days after the event day. However, the test statistics show that the difference of CARs between the buy and the hold recommendation are not statistically significant from zero in the entire window $[-30, 30]$. It means that the abnormal returns in the buy and hold recommendations are equal based on a shorter event window.

Since there is no sign of building-up of positive CARs in the shorter event window $[-30, 30]$ in the buy or hold recommendations' group, the significant positive CAR for the buy recommendations' group in the longer event window $[-120, 120]$ is due to the other events that occurred earlier than the release of analysts' recommendations. This result is consistent with the earlier results in Section 6.6.1, and therefore it confirms that there is no leakage of analysts recommendations or insider trading prior to the release of the recommendations. Table A.4 in Appendix A.6 depicts the abnormal returns for the buy and hold recommendations.

In summary, the findings using the market model of event study suggest that the release of the analysts' initial reports and their accompanying recommendations is not a

significant nor an informative event. It means that the analyst report is not judged as an important document that investors can benefit from. Even the analysts' favourable recommendations do not have any significant positive effects on returns. It is an indication that the release of the analysts' initial reports is not really an event. The study finds that there is no evidence that there is any leaking of information from the analysts reports or their recommendations. The presence of insider trading prior to the release of the analysts' initial reports is also not supported.

Market-adjusted return

We replicate the analysis using the market-adjusted model as in Equation (6.4) and calculate the CAR for each group as shown in Figure 6.8. Focusing on the event day, the results are similar with the previous ones. The abnormal return on the event day for the buy recommendations' group is 0.006%. The t -test statistics is 0.019, the standardised t -test statistics is 0.083 and the rank test statistics is 0.511, which means that all the test statistics on the event day $t=0$ for the buy recommendation are not significantly different from zero. The abnormal return for the hold recommendations is -0.383% . The t -test statistics is -0.90 , the standardised t -test statistics is -1.198 , and the rank statistics is -0.938 . It means that the abnormal return on the event day, $t=0$, for the hold recommendation is also not significantly different from zero. The insignificance of abnormal return on the event day means that the analyst recommendation either the buy or hold is not really an important event.

The negative CARs in the event window $[-120, 120]$ for the buy and hold recommendations as well as the control group are significant from zero for most of the times in the event window. Even though the magnitude of CAR is significant, it is meaningless because the direction of CAR is going downtrend. It means that the analysts' recommendations are not capable of generating positive returns. Essentially, there is no sign of growing build-up of positive CAR prior to the recommendations and therefore there is no sign that there is any leaking of analysts recommendations or insider trading prior to the recommendations.

We further replicate the investigation using a shorter event window $[-30, 30]$ and

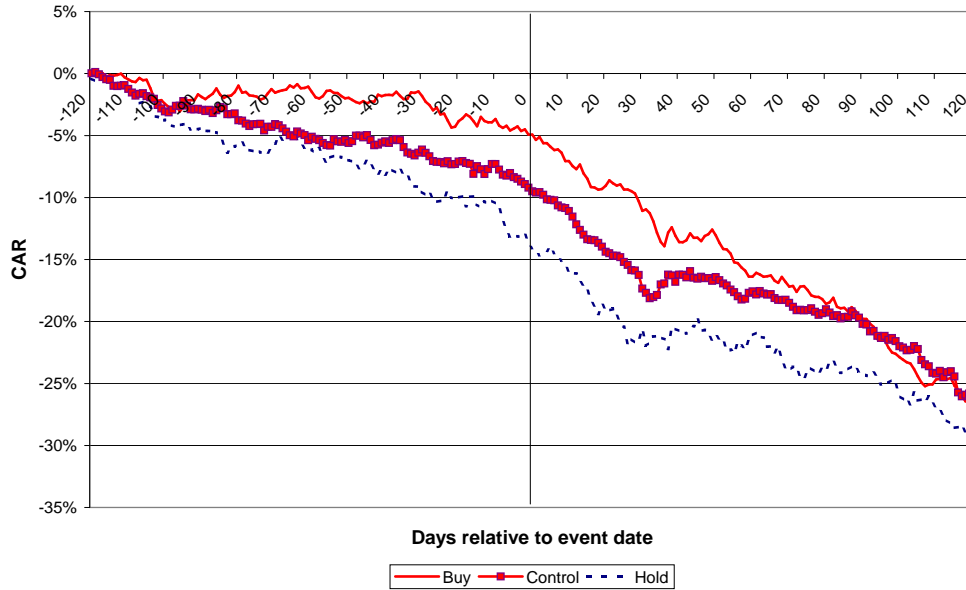


Figure 6.8: CAR market-adjusted model - buy, hold & control group

similar results still prevail. Essentially, we find that there is no sign of growing build-up of positive CAR prior to the event and therefore there is no evidence of leaking of information or insider trading. The direction of CARs is going downtrend and therefore has negative values.

Event study using the market-adjusted return model shows that the analyst recommendation is not a significant event that could have significant impact on returns. Since the analyst recommendation is not judged as an important document, the model does not find that there is a growing build-up of CAR that could suggest the presence of insider trading or information leaking prior to the event.

In summary, there is not enough evidence to show that there is any significant growing build-up of positive CAR in the buy or hold recommendations' companies prior to the release of analysts recommendations using two models of event study either in the long or short event window. Therefore there is no evidence that there is any leaking of analysts recommendations or insider trading from the recommendations. Furthermore, we have examined the event window $[-30, 30]$ and found that there is no other major corporate events during the event window that could affect the results. The insignificance results

are consistent with the earlier ones which means that the building-up of positive CAR in the event window $[-120, 120]$ prior to the event is due to other events and is not due to the analysts recommendations. Consistent with our previous results, the analysts recommendation is not a significant or influential event that contained useful information to investors since the abnormal return on the event day is not significantly different from zero. Therefore the release of the analysts recommendations is not really an informative event.

6.6.5 Non-parametric tests

We have mentioned earlier in Section 5.4.4 that the non-parametric approach is used when we do not make any assumption about the distribution of the variable we are investigating. In this section we report the event study results using rank statistics, one of the most widely non-parametric approaches, and then compare with those using a parametric approach.

We apply a rank statistics approach using both the market model and market-adjusted return models to perform significance tests of abnormal returns in the event study. The calculation of rank statistics is disclosed earlier in Section 5.4.4. We compare the results of test statistics we mentioned in previously in Section 5.4.4 namely the t -test, standardised t -test and rank test statistics. The t -test and standardised t -test are parametric approach while the rank test is non-parametric approach. Table 6.34 shows the results of testing the significance of abnormal return based on market model using event window $[-10, 10]$. The results show that all the test statistics are capable to detect the presence of abnormal returns.

We have replicated the same analysis by using the market-adjusted return model. We compare the results of the statistical test of the significance of abnormal return between the non-parametric approach and parametric approach. Using event window $[-30, 30]$, we compare the abnormal return tests of significance using rank statistics and the parametric approach. In both models, the t -test and standardised t -test are able to detect the presence of abnormal return more frequent than the rank statistics. Armitage (1995) suggests that the t -test procedure is the best procedure, while Brown and Warner

Table 6.34: Test statistics of abnormal return

Day	Abnormal return (%)	<i>t</i> -test <i>t</i> -value	std. <i>t</i> -test <i>t</i> -value	rank test <i>t</i> -value
Day -10	0.100	0.410	0.296	1.076
Day -9	-0.415	-1.705	-1.497	-2.054**
Day -8	-0.681	-2.796***	-3.145***	-1.670*
Day -7	-0.352	-1.443	-2.134**	-1.094
Day -6	-0.376	-1.541	-1.530	0.023
Day -5	0.061	0.250	0.128	0.925
Day -4	0.175	0.718	0.958	1.106
Day -3	-0.165	-0.675	-0.599	-2.009**
Day -2	0.322	1.322	0.917	0.629
Day -1	-0.520	-2.133**	-1.958*	-1.328
Day 0	-0.092	-0.379	-0.423	-0.427
Day 1	-0.198	-0.813	-0.980	-0.508
Day 2	0.016	0.068	0.644	0.440
Day 3	-0.018	-0.074	-0.245	-0.424
Day 4	0.193	0.791	0.939	1.177
Day 5	0.126	0.519	0.795	0.661
Day 6	-0.333	-1.366	-1.570	-0.884
Day 7	-0.010	-0.042	0.150	0.200
Day 8	-0.218	-0.896	-1.233	-0.687
Day 9	-0.242	-0.993	-0.759	0.073
Day 10	-0.069	-0.282	-0.372	-0.352

notes: *** significant at 1%, ** significant at 5%, * significant at 10%

(1980) suggest that the parametric approach is well-specified in testing the abnormal performance.

6.7 Stock valuation around event day

Previously, we have showed the empirical results that the analysts reports are not influential in attracting and persuading investors to change their expectation and beliefs about the future value of an asset. As a result, there is no significant impact on stock valuation after the release of analysts reports as shown in Section 6.4.1 and Section 6.5. We have

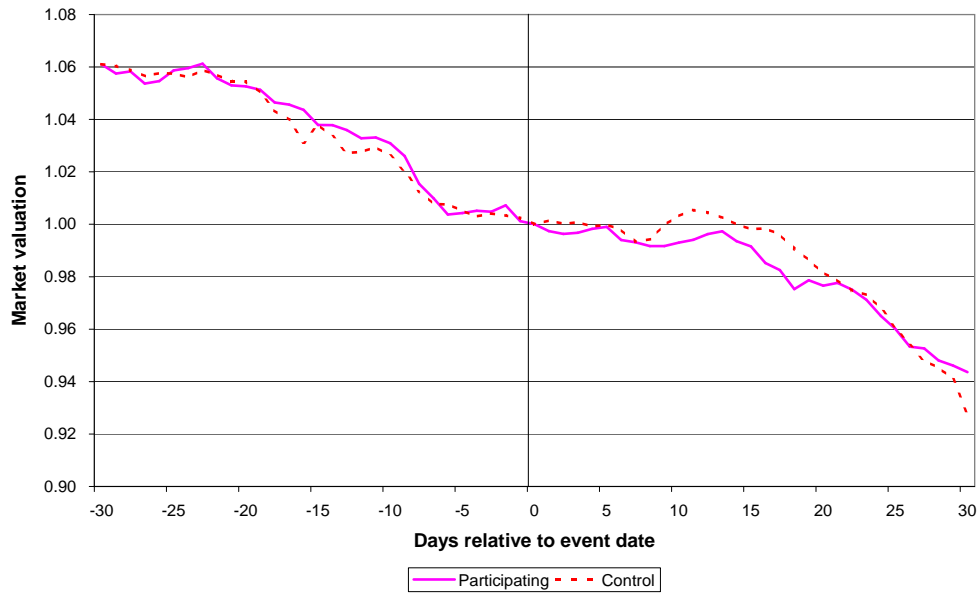


Figure 6.9: Market valuation around event date - participating vs. control

also showed that there is no concrete evidence that there is any leaking of information or the prevailing of insider trading prior to the event.

In this section, we examine the pattern of stock valuation around the event day. Stock valuation is based on the movement of share prices times the units of shares. Since we are interested in examining the pattern of stock valuation around the event day, stock valuation of each company in each group is based on the event day as the reference day. This means that stock valuation on the event day equals one and the change of stock valuation relative to the event day is examined from the based date. In other words, if there is any significant change of stock valuation from the event day, it will be seen in the plotted graph. In the previous section, we have disclosed that the period of 30 days before and after the event is rather free of other important corporate events. Figure 6.9 plots the movement of stock valuation around the event date.

In general, stock valuation in both the participating and control groups are declining during the 120-day period before and after the event. Figure 6.9 further shows that the movement of stock valuation in the participating and control group is very closed and similar with each other, despite the differences of composition between the two groups.

Further examination reveals that the difference of stock valuation between the participating and control group is not significant from zero throughout the whole 30-day period before and after the event.

As depicted in Table 6.35, basically the t -value measures the difference of stock valuation between the participating and control group and the difference is compared with the standard error of each group for each day relative to the event day. The t -value is assumed to be distributed according to the t distribution. The t -value on the event day is assumed to be zero. The results of insignificance t -values at the 5% significance level in each day during the window $[-10,10]$ support our earlier findings that there is not enough evidence to support that the event is an informative and important event that could possibly influence investors to become more optimist in their valuation.

Previously, in Section 6.5.1 the results show that there is no significant difference of mean daily stock valuation between the buy and hold recommendations during the sub-period before and after the event. Using a similar approach, we compare stock valuation between the buy and hold recommendations groups using the event day as the based date. With reference to the base date, we find that both groups show similar patterns of movement of stock valuation around 30 days before and after the event day in which stock valuation is declining. From Figure 6.10, we find that there is no clear and obvious evidence that stock valuation has increased following the buy or hold recommendations. The t -value shows that the difference of stock valuation between the buy and hold recommendations is not significantly different from zero at the 5% significant level throughout the entire window $[-30,30]$. It means that the recommendations are not influential to increase investors' confidence and optimism, despite the favourable recommendations. As a result there is no increase in stock valuation after the recommendations.

Therefore, there is not enough evidence that the analysts recommendations could have influence investors confidence and optimism. As there is no increase in investors optimism and confidence, there will be no change in investors' demand for buying more shares, and hence there is no change in stock valuation. Since there is no significant change in stock valuation after the analysts recommendations, the analysts recommendations are not influential and the release of recommendations is not really an event.

Table 6.35: Stock valuation around event day - participating vs. control group

Day	Participating	Control	Difference	<i>t</i> -value
-10	1.0309	1.0262	0.0047	0.387
-9	1.0260	1.0202	0.0058	0.476
-8	1.0154	1.0128	0.0027	0.275
-7	1.0099	1.0077	0.0022	0.260
-6	1.0037	1.0076	-0.0039	-0.510
-5	1.0043	1.0052	-0.0009	-0.134
-4	1.0052	1.0030	0.0022	0.305
-3	1.0048	1.0041	0.0007	0.101
-2	1.0072	1.0034	0.0038	0.608
-1	1.0012	1.0024	-0.0012	-0.355
0	1.0000	1.0000	0.0000	0.000
1	0.9974	1.0015	-0.0041	-0.859
2	0.9964	1.0001	-0.0038	-0.551
3	0.9967	1.0008	-0.0040	-0.488
4	0.9983	0.9992	-0.0009	-0.108
5	0.9990	0.9998	-0.0008	-0.077
6	0.9940	0.9980	-0.0040	-0.395
7	0.9931	0.9933	-0.0002	-0.015
8	0.9917	0.9943	-0.0026	-0.227
9	0.9917	0.9998	-0.0081	-0.625
10	0.9930	1.0031	-0.0101	-0.748

6.8 Trading volume around event day

In this section and the sections that follow, we use a similar approach in the event study. The long event window $[-120, 120]$ is used so that any indication of leaking of information or insider trading could be detected. We examine the pattern of movement of the variables and compare with the ‘normal’ period or the estimation period. Basically, it examines whether there is any significant change that occurs during the event window. Eventually, the test of significance assumes that the observations are drawn from the same population. The null hypothesis we are going to test is that the variable under the study during the particular event window is significantly higher than the normal period. Moreover, since we have verified that there is no other event that occurs in the shorter

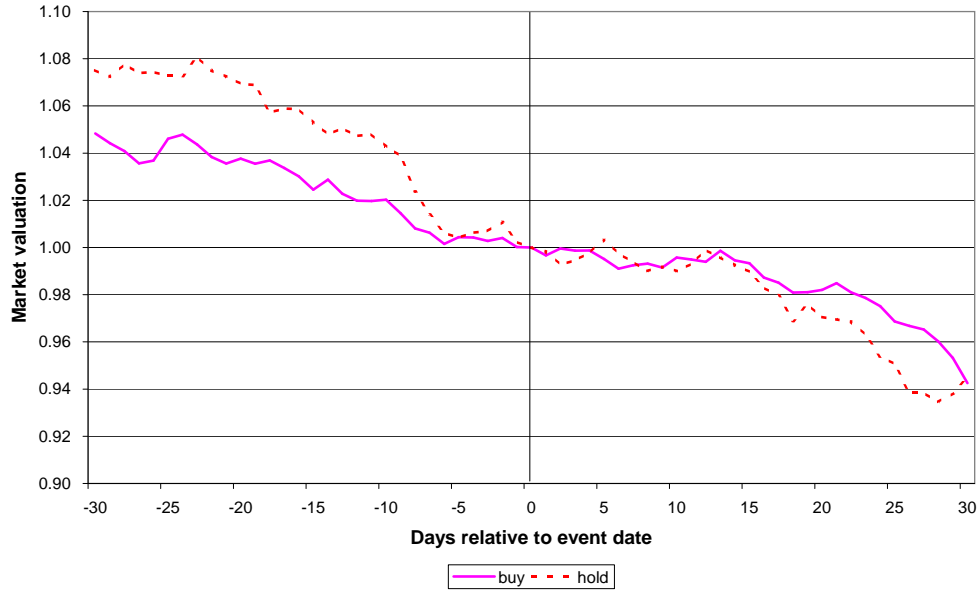


Figure 6.10: Market valuation around event date - buy vs. hold recommendations

event window $[-30, 30]$, the pattern of movement in this event window is of particular interest and will be examined.

We have shown earlier in Section 6.4.3 that it is evidence that there is no significant increase of trading volume prior to and after the release of analysts' initial reports. Using a similar approach in event study, we examine the pattern of trading volume surrounding the event window $[-120, 120]$. We test the significance of turnover in the event window $[-120, 120]$ against the estimates using 100 trading days period as mentioned earlier in Section 5.4.2.

Basically, we compare daily turnover in the event window with the mean of the estimated turnover in the estimation period which we assume as a normal period. Assuming that the turnover is withdrawn from the same population, the null hypothesis we are testing is that there is no difference of trading volume between the event window and the normal period.

We examine the pattern of daily movement of trading volume around the event window $[-120, 120]$ shown in Figure 6.11. We find that there is no indication that trading volume

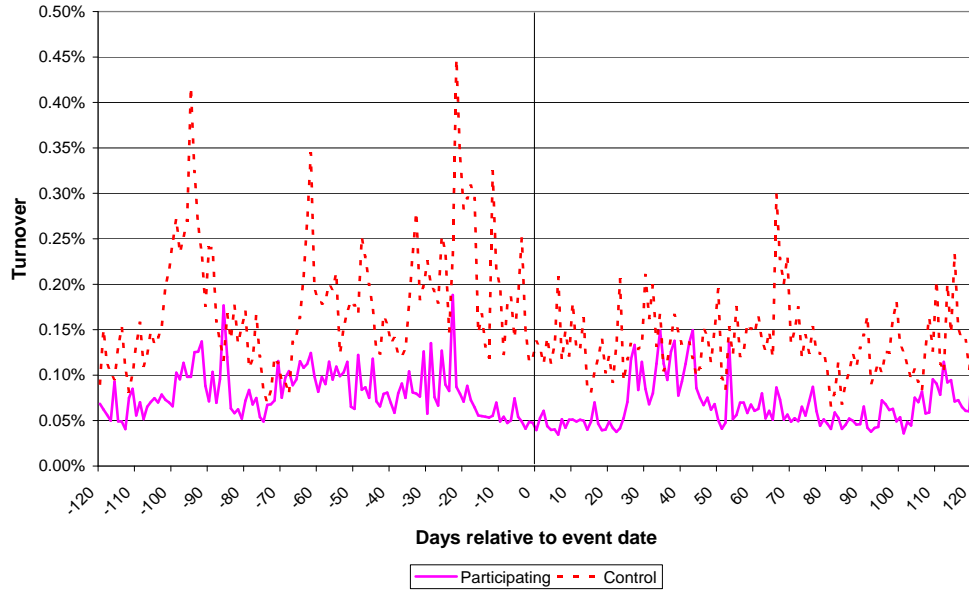


Figure 6.11: Trading volume - participating vs. control

in the participating group has increased after the analysts reports are released. Due to the difference in the composition between the participating companies and the control group, trading volume in the control group is inherently and consistently higher than the participating group during the entire event window $[-120, 120]$. Nevertheless, the pattern of daily movement of trading volume between the participating companies and the control group is closed with each other. It is indicated from the statistical tests of cross-section of mean difference of trading volume between the participating companies and the control group. The results show that the difference significant from zero in only some of the days in the event window $[-120, 120]$.

The event window $[-30, 30]$ is of particular interest due to the fact that there is no other event in most of the companies except the release of the analysts reports. Since the trading volume is not significantly higher than normal and the difference is not significant from zero at the 5% significant level during the event window $[-30, 30]$, it means that the analysts reports are not influential to generate more interest in investors to trade. As a result, there is no significant improvement in trading volume after the release of the analysts reports. This result support our earlier findings that the analysts reports do not

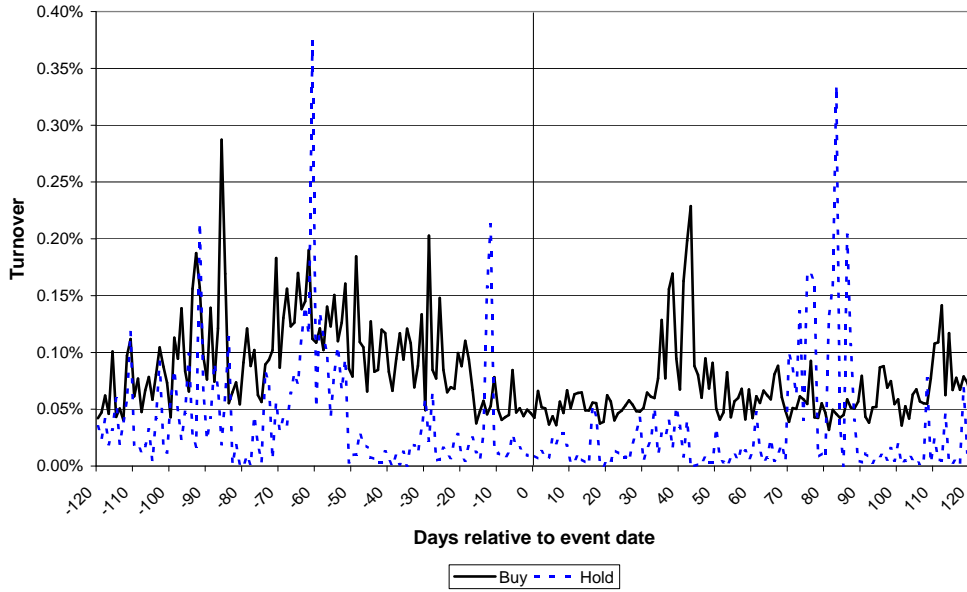


Figure 6.12: Trading volume - buy vs. hold recommendations

have a significant impact on trading behaviour. However, there are more occurrences of significant turnover in the control group which is due to the composition of control group which has more big companies than the participating group.

We replicate our examination on stock turnover by dividing the companies into the type of recommendations they received. It is noted that turnover in the buy companies is higher than the hold companies in almost the whole event window $[-120, 120]$ as shown in Figure 6.12. Statistical tests show that turnover within the buy and hold companies are not significantly higher than the normal period in most of the days in the event window $[-120, 120]$. Similarly, cross-section mean difference test of turnover between the buy and hold companies is statistically significant from zero only a few days in the event window $[-120, 120]$. Earlier, we have verified that there is no other important event that occurs during the event window $[-30, 30]$, so there is no other event that could have affected the results. Therefore we do not find evidence that trading activities have increased after the release of analysts recommendations. Neither the buy nor the hold recommendations are influential to attract traders to trade more after the recommendations are released.

In summary, the analysis reveals that the analysts reports and their accompanying

recommendations are not able to generate or influence higher interest in the market to trade, otherwise we will be able to detect a significant increase in trading volume continuously after the reports are released. It means that the release of analysts' initial reports is not really an event.

6.9 Bid-ask spread around event day

Previously in Section 6.4.4, we find that there is no significant change in the bid-ask spread for companies participating in the incentive scheme prior to and after the release of analysts' initial reports. We continued our investigation by analysing the pattern of daily movement of the bid-ask spread using a similar approach in the event study. Basically, the bid-ask spread in the event window is compared with the one estimated using a 'normal' period.

We examine the bid-ask spread in the event window $[-120, 120]$. In general, the bid-ask spread in the participating group is higher than the control group throughout the event window. It means that the participating group is less liquid than the control group. It means that information asymmetry is greater in the participating group. This could be due to the difference in the composition between the participating companies and the control group.

The bid-ask spread within the group in the event window is compared with the estimates using 100 trading days period as mentioned earlier in Section 5.4.2. The statistic tests show that the bid-ask spread in the participating group is higher than normal in only a few days in the event window $[-120, 120]$. However, there is no clear pattern as it happens sporadically in the event window. The same thing occurs in the control group.

Due to the nature of noise in the bid-ask spread, Figure 6.13 presents a shorter event window $[-20, 70]$ of the bid-ask spread in participating companies and the control group. Although there is no obvious pattern of bid-ask spread movement in the event window, the bid-ask spread in the participating companies and the control group are no different from normal in most of the time in the event window. Although we cannot establish any meaningful pattern, the statistical tests show that the bid-ask spread in the participating

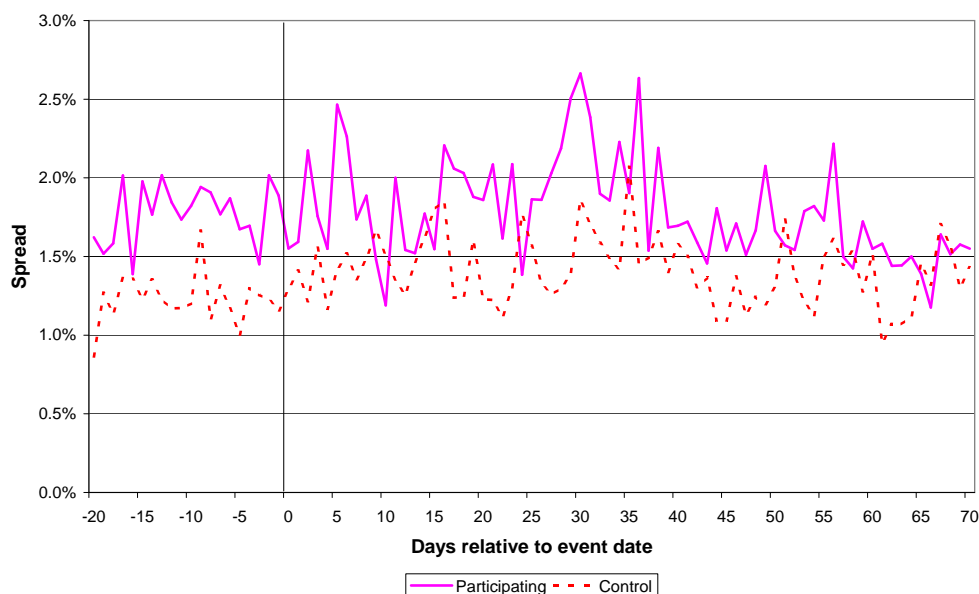


Figure 6.13: Bid-ask spread - participating vs. control

companies and the control group are not significantly reduced on the event day, a day before and after. It reflects that the analysts reports do not have a significant impact in reducing the bid-ask spread around the event day.

Even though the statistical result is not significant, the occurrence of a higher bid-ask spread and a lower trading volume in the participating group is consistent with the theory mentioned in Section 3.6. Earlier, we have observed that trading volume in the participating group is mostly lower than that in the control group. Moreover, the bid-ask spread in the participating group is mostly higher than that in the control group. Therefore, the negative relationship between the bid-ask spread and trading volume is observed, which is consistent with Amihud et al. (2005).

We replicate our examination on the bid-ask spread by dividing the companies into the type of recommendations they received. Figure 6.14 shows the pattern of the daily bid-ask spread between the buy and hold recommendations using the same event window $[-20, 70]$. In general, the buy recommendations have lower bid-ask spread than the hold recommendations as shown in the graph. However there is no obvious pattern of decreasing bid-ask spread in either the buy or hold companies after the release of the

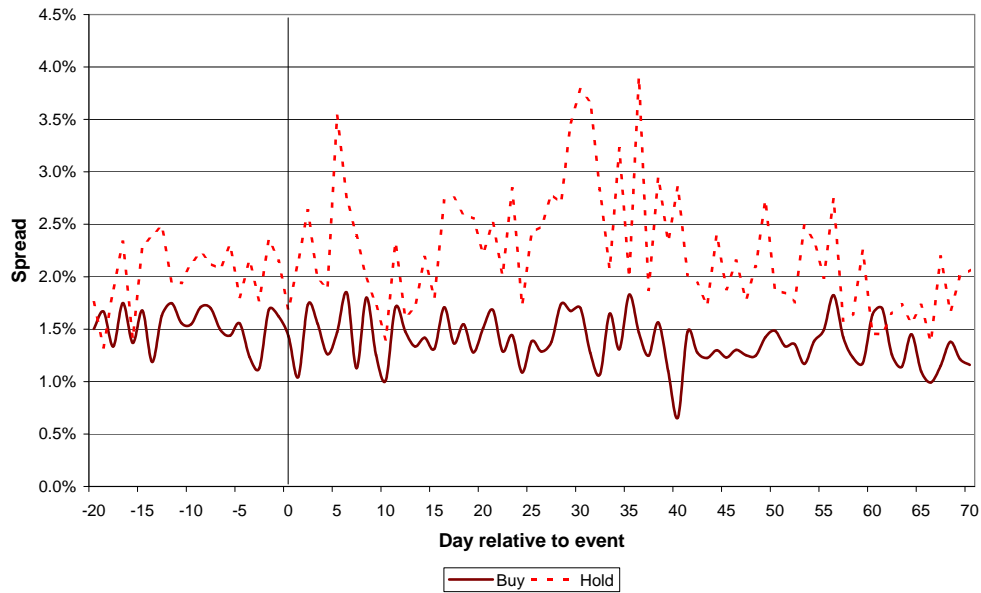


Figure 6.14: Bid-ask spread - buy vs. hold recommendation

recommendations. Consistent with the earlier results, significant statistical tests occur on many days in the event window. However, due to the noise in the bid-ask spread, there is no clear pattern of bid-ask spread in the buy and hold recommendations' group. This means that the analysts recommendations are not really useful or influential in reducing the bid-ask spread. Since the bid-ask spread is widely used as a proxy to measure information asymmetry, the analysts recommendations do not contain useful information that can reduce the asymmetry, and therefore the analysts recommendations are not an informative event.

In general, the statistical tests of the bid-ask spread in the event window shows no clear evidence that the bid-ask spread has substantially increased or decreased after the release of the analysts' initial reports and their recommendations. As the bid-ask spread can be used as a proxy for the costs of trading, it means that there is no change of the costs of trading after the event. As the cost of adverse information is one of the components of the bid-ask spread, it means there is no substantial change in adverse information costs after the event. In other words, the analysts reports and their recommendations do not reduce the cost of adverse information. As a result, information asymmetry is

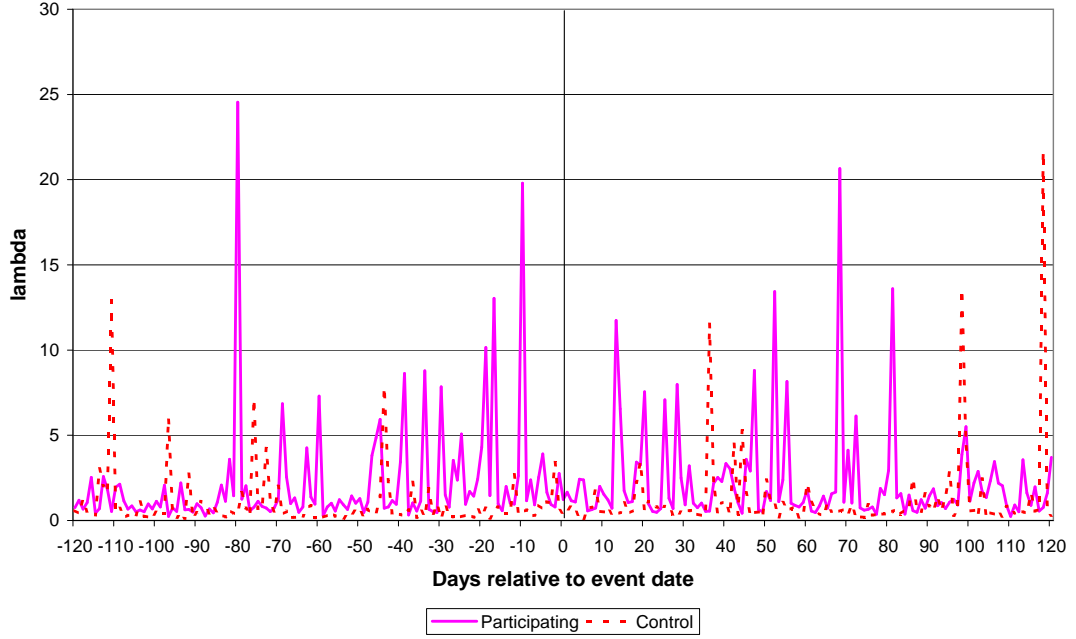


Figure 6.15: Illiquidity measure, λ_a - participating vs. control

not reduced among investors. Therefore, the release of the analyst reports and their accompanying recommendations are not an important and informative event that could reduce information asymmetry.

6.10 Illiquidity measure around event day

Previously in Section 6.4.5 the study finds that there is no significant impact on the illiquidity measures in the participating group prior to and after the release of the analysts reports. The analysis is continued by examining the illiquidity measure around the release day of the analysts' initial reports using similar methods in the event study.

The movement of daily liquidity measure, λ_a , in the event window $[-120, 120]$ is shown in Figure 6.15. In general, the illiquidity measure, λ_a , in the participating group is higher than the control group during most of the days in the event window $[-120, 120]$. It means that companies in the participating group are less liquid than the control group. This could be due to the difference in the composition of companies between the two groups.

It is also noted from Figure 6.15 that the distribution of illiquidity measures in both the participating companies and the control group is skewed to the right and not normal.

Since the distribution of illiquidity measures highly deviates from normal distribution, a non-parametric test is used on the mean ranked illiquidity measures. This non-parametric method is proposed by Corrado (1989) which has been described earlier in Section 5.4.4. The ranking procedure transforms the distribution of data into a uniform distribution across the possible rank values regardless of any asymmetry in the original distribution. Under the null hypothesis, the test statistics of illiquidity rank is a drawing from a uniform distribution (Corrado, 1989).

The rank test on the illiquidity measure, λ_a , shows that there are only four observations in the event window $[-120, 120]$ that are statistically significant. In general, the rank test shows that there is no significant change of illiquidity measures, λ_a , for the participating companies before and after the event day. However, in the control group there are more occasions where the rank test statistics are significant. The results are expected as the size of the control group is bigger than the participating companies. Appendix A.5 depicts the rank statistics for some of the days in event window $[-30, 30]$.

In order to examine the mean difference of illiquidity measures, λ_a , between the participating companies and the control group, we use normalised measures following Bhattacharya et al. (2000). First, an individual illiquidity measures for a particular day is divided by the average individual illiquidity measures in the estimation period. Second, the normalised illiquidity measures for each share is averaged across all shares for each day. The test of mean differences of illiquidity measure between the participating companies and the control group shows that there are only a few days where the differences are statistically significant from zero.

Since the significant statistics of the mean differences between the participating companies and the control group occur sporadically in the event window, we are not able to establish any pattern of significance that could be attributed to the release of the financial analysts' reports. We have also used the alternative measure of illiquidity measure, λ_b , as mentioned in Section 5.3.3 and the results are similar. Therefore we cannot make a useful or meaningful comparison about the illiquidity behaviour in the participating group or

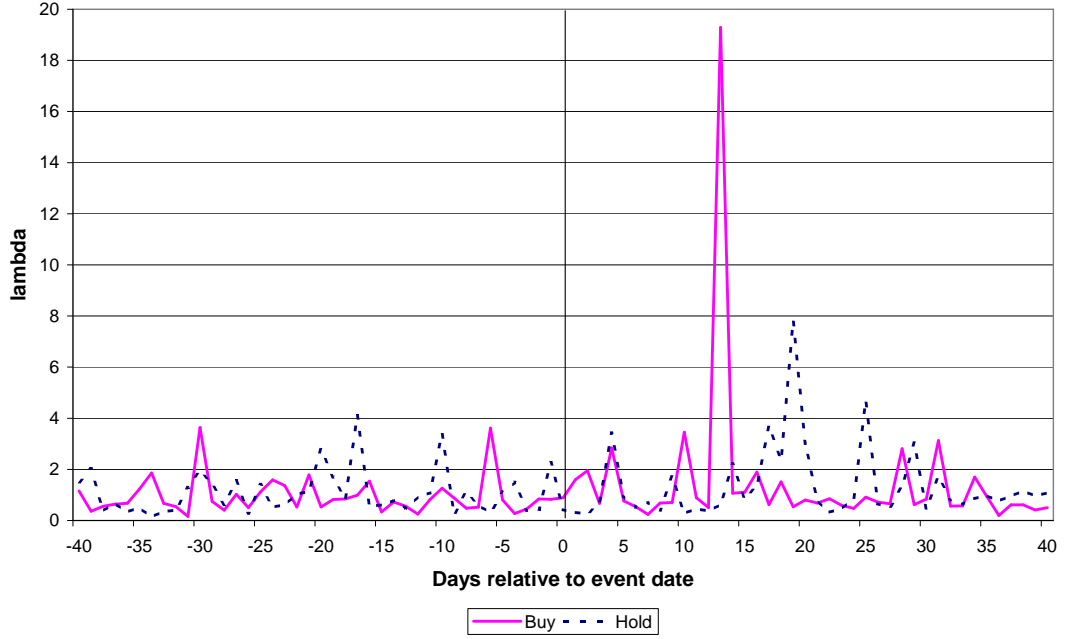


Figure 6.16: Normalised illiquidity measure, λ_a - buy vs. hold recommendations

the control group.

The analysis is replicated by dividing the participating group into the type of recommendations they received. Due to the nature of non-normality of the illiquidity measures, Figure 6.16 presents the normalised illiquidity measure, λ_a , in a shorter event window $[-40, 40]$ for companies with buy and hold recommendations. In general, the illiquidity measure for the buy recommendations is lower than the hold recommendations, which means that the buy recommendations' group is more liquid than the hold recommendations' group.

The results of the rank statistics of the illiquidity measures for the buy recommendations in the event window $[-120, 120]$ show that there are only five observations that are statistically significant, meanwhile there are only seven observations for the hold recommendations that are statistically significant. Therefore, the rank statistics do not provide conclusive evidence that there is a significant change in the illiquidity measure that could be linked with the release of the financial analysts' reports.

The mean difference of illiquidity measure between the buy and recommendations is also examined using the normalised illiquidity measure. Consistent with our earlier results, there is no conclusive evidence that the illiquidity measure in the buy recommendations' group is lower than the hold recommendations' group on a daily basis. Within the buy or the hold groups, we find that the illiquidity measure is not significantly higher on the event day or a day before or day after the event. Although illiquidity measure on some of the days are significantly higher, there is no meaningful pattern that could be established. Therefore, there is no meaningful comparison between the buy and hold recommendations that could be made.

In summary, the statistical tests of the illiquidity measures, λ_a and λ_b , show no clear evidence that there is a significant change after the release of the analysts' initial reports and their recommendations. As the illiquidity measures can be used as a proxy for information asymmetry, it means that there is no change of the level of information asymmetry in the participating group after the event. In other words, the analysts reports and their recommendations are not able to reduce the level of information asymmetry in the companies that are participating in the incentive scheme. The results are consistent with our previous empirical results, which indicate that the release of the analysts reports is not an important nor an informative event.

6.11 Effects of trading of private information

We have mentioned earlier in Section 3.7 and 5.3.3 that the volume-return relation could be used as a proxy to measure private information trading. In essence, Llorente et al. (2002) suggest that stocks with high degree of information asymmetry tend to show a tendency for return continuation following high-volume days, while stocks with low degree of information asymmetry tend to show return reversal following high-volume days. Return continuation means that there is positive autocorrelation of return, while return reversal means there is zero autocorrelation of return. Return continuation indicates a high degree of private information trading as the informed trader has not yet revealed all their information. As the price has not yet revealed all information autocorrelation

of return is observed, consistent with strategic trading of informed trader suggested by Kyle (1985).

We perform time-series regression on each companies using all data and then according to respective sub-periods. The first sub-period regression is for the period prior to the release of the analysts reports, and the second sub-period regression is after the release of the reports. Essentially, we follow Llorente et al. (2002)'s time-series regression which is modeled as follows,

$$r_{i,t+1} = c_0 + c_1 r_{i,t} + c_2 r_{i,t} v_{i,t} + \varepsilon_{i,t+1}. \quad (6.5)$$

where $r_{i,t}$ is stock return, $v_{i,t}$ is trading volume represented by stock turnover. The estimation for the first sub-period we used $-220 < t < 0$, while for the second sub-period the time-series regression is for $0 \leq t < 170$. We use a long window prior to the event so that we are able to capture any private information trading that could take place long before the event. Llorente et al. (2002) suggest that high c_2 estimate is an indication that there is a high degree of information asymmetry in stock i due to return continuation following a high-volume day.

We obtain estimates of c_2 for each company in the participating group as well as the control group from both sub-periods as well as from all periods. Table 6.36 compares the magnitude of c_2 estimates and shows the differences between the participating companies and the control group. Results from Table 6.36 show that none of the t -value indicates evidence of statistically substantial difference of c_2 estimates between the participating companies and the control group either in each sub-periods or the whole period. The insignificant differences of c_2 estimate between the participating companies and the control group means that the degree of information asymmetry in the participating companies is equal with the control group.

Despite the difference of composition between the participating companies and the control groups, the results show that the difference has no significant bearing on statistical tests. Within the participating companies, the difference of c_2 estimates between the sub-periods is not significant from zero at the 5% level (t -value= -1.515 , p -value= 0.136). This shows that the analysts reports do not have any significant impact in reducing information asymmetry in the participating companies. Similarly, within the control

Table 6.36: c_2 (x 100) estimates - participating vs. control group

	Participating	Control	Diff.	t -value	p -value (2-tailed)
All period	0.050	0.067	-0.017	-0.526	0.600
Sub-period before	0.068	0.065	0.003	0.077	0.939
Sub-period after	0.171	0.070	0.100	1.369	0.176

group we find that there is no substantial differences of c_2 estimates between sub-periods (t -value= -0.200 , p -value= 0.842).

The results are consistent with the earlier results that there is no difference of private information trading in the participating companies as well as in the control group. It means that there is no significant changes of the degree of private information trading between the sub-periods. In other words, after the release of the analysts' initial reports there is no substantial effects in the degree of information asymmetry in companies that are participating in the incentive scheme or in the control group.

We continued our analysis by comparing c_2 estimates within a group of each recommendation between companies with buy and hold recommendations. The results from Table 6.37 show that all t -values are not statistically significant which means that there is no substantial differences of c_2 estimates between buy and hold recommendations. This reflects that there is no difference of the degree of private information trading between the buy and hold recommendations. The insignificant difference between the buy and hold recommendations means that the impact of the recommendations are equal.

Among companies with the buy recommendations, the difference of c_2 estimates between the sub-periods of -0.213 is not statistically significant at the 5% level (t -value= -1.763 , p -value= 0.089). Similarly, companies with hold recommendations do not show statistically significant differences between the sub-periods (t -value= 0.523 , p -value= 0.605). It means that there is no significant change of the degree of private information trading in companies between sub-periods in either the buy or hold recommendations, thus the buy or hold recommendations have no impact in reducing information asymmetry.

We replicate our analysis by examining the magnitude of c_2 estimates using a shorter

Table 6.37: c_2 (x 100) estimates - buy vs. hold recommendations

	Buy	Hold	Diff.	t -value	p -value (2-tailed)
All period	0.021	0.083	-0.062	-1.184	0.243
Sub-period before	0.021	0.120	-0.100	-1.668	0.102
Sub-period after	0.234	0.100	0.134	0.995	0.326

time-series regression. We use two time-series regression, the first time-series regression is for $-30 < t < 0$, and the second time-series regression is for $0 \leq t < 30$. Moreover, the window $[-30, 30]$ has been verified in the earlier section as having the least confounding effects. We use a shorter time period due to the immediate effects of news announcement reported in previous studies. We find that the similar results stated earlier still stand. In particular, despite using a different window of time-series, the difference of c_2 estimates between the time-series before and time-series after the event for the participating companies is not statistically significant from zero at the 5% level (t -value= 0.791, p -value= 0.433).

Furthermore, out of 55 c_2 estimates of participating companies in the first time-series of 30 days before the event, only three companies have c_2 estimates greater than zero and statistically significant at the 5% level. In the second time-series 30 days after the event, there are also three companies that have significant c_2 estimates. It means that there is no change in the occurrence of private information trading after the event. We continued our analysis by examining the difference between the buy and hold recommendations. Similarly, the differences of c_2 magnitude between the buy and hold companies are also not statistically significant from zero in the first time-series (t -value= 1.158, p -value= 0.252), and also in the second time-series (t -value= 0.780, p -value= 0.439).

The results show that the level of private information trading are not affected despite using a different window of time series. The insignificant results are consistent with our previous empirical results. Basically, we find that the analysts reports are not influential nor have value-added. In summary, we have examined the changes of the degree of information asymmetry using c_2 estimates as the proxy to measure private information trading. The results show that we do not find enough evidence to reject the null hypoth-

esis. In other words, the degree of information asymmetry is not effected by the release of the analysts' initial reports and there is no evidence to suggest that private information trading has declined substantially after the analysts reports are released.

6.12 Summary

In this chapter, we began our analysis of data by exploring the statistics by dividing the time-series data into three sub-periods around the release day of analysts' initial reports. We then compared the statistics between the participating companies and the control group. We continued our data analysis by dividing the datasets into companies receiving favourable recommendations and companies with less favourable recommendations, and then performing statistical tests. We then used the event study method. Both the parametric and non-parametric approaches were tested. We chose the parametric approach since our empirical test showed that it is superior in terms of the ability to detect the presence of abnormal returns. We applied an event study approach in all the variables involved using a different event window. Finally we examined a new proxy of information asymmetry suggested in recent literature.

Instead of using one event window, we have modified our analysis by varying the sub-period in order to capture the presence of insider trading or a leaking of information or the confounding effects of other events. The overall results indicate that there is not enough evidence to reject all the null hypotheses that we have outlined previously in Section 5.2.2. The statistical tests we performed show that the release of the analysts reports and their accompanying recommendations are not an important or influential event. The reports have no significant effects in increasing stock valuation, stock return and trading volume in companies that are participating in the scheme.

Effectively, the evidence shows that the analysts reports do not reveal new information to investors. It means that the financial analysts research incentive scheme is not beneficial to companies participating in the scheme nor to investors that follow the analysts advice. The results are not consistent with the results from previous studies we discussed earlier in Section 4.6. We will discuss the implication of results in the next chapter and

provide possible reasons for the results being inconsistent with many previous studies findings.

Chapter 7

Discussions and implications

7.1 Introduction

This chapter continues with the discussion of the findings from Chapter 6. This chapter summarises the research findings by analysing and discussing how the results of the hypothesis testing have contributed towards the research question including implications for the research findings for policy makers or the relevant authority. The discussion will also include practical suggestions with regard to the efforts in reducing information asymmetry in the financial markets.

7.2 Discussion of results

This thesis examines the presence of information asymmetry in the financial markets. The effects of information asymmetry is discussed in detail in Chapter 3. As the prevalence and persistence of information asymmetry is natural in the economies, the authority should interfere in order to reduce information asymmetry. We have mentioned earlier in Chapter 1 and 2 that the authority in the Malaysian stock market is aiming to increase promotion and publicity of listed companies, develop good relations between listed companies and investors, provide consistent and reliable information flow, increase the pool of financial analysts coverage and ultimately increase the trading of shares and liquidity of shares especially among the small and medium size companies.

In order to help investors to become well-informed in their decision, the Malaysian stock exchange has initiated an incentive scheme to increase analysts coverage where listed companies are invited to participate in the incentive scheme. The two-year pilot exercise was concluded in July 2007 with more than 300 listed companies and 21 research companies participating in the incentive scheme. In short, companies that were participating in the scheme were continuously covered and reported by the analysts during the period, and hence investors were supposedly more informed about the companies.

Therefore the main research question in this thesis is to answer the question whether the incentive scheme of financial analysts coverage is beneficial to reduce the degree of information asymmetry in companies that were involved in the scheme. In particular, the research is investigating whether the incentive scheme has achieved its targets. In order to answer the research questions, we have examined in Chapter 3 the theory of price formation under information asymmetry where the informed trader would manipulate private information that he/she has in his/her possession. The role of the financial analysts in reducing information asymmetry is reviewed in Chapter 4.

In the effort to answer the main research question whether the scheme is successful and beneficial, we have outlined several hypotheses to be tested in Chapter 5. This section is devoted to discussing the results of the analysis that have been performed earlier.

7.2.1 Effects on stock valuation

Firstly, the study examines the effects of the analysts reports on prices by investigating the movement of stock valuation of companies involved in the incentive scheme. Due to the difference of market valuation within the participating companies and the control group, a comparison between the groups is not possible. However, the movement of stock valuation within the groups is very close and similar. Our analysis in Section 6.4.1 shows that the analysts reports have no significant effects in stock valuation either in the participating companies or the control group. In Section 6.5.1, the result shows that the analysts recommendations are also not able to significantly move the prices.

Further examination on daily movement of stock valuation in Section 6.7 reveals that there is no significant change on the stock valuation on the event day ($t=0$), a day before

($t=-1$) and after the event ($t=1$). Previous studies indicate that the magnitude of the stock valuation is the highest within the three days event window. However, in the case of companies participating in the incentive scheme even the favourable analysts recommendations are not sufficiently influential to push up the stock valuation. Essentially, our results are not consistent with the findings of the previous studies that we discussed earlier in Section 4.6. For example, Lang et al. (2004) report that an increase in the activity of financial analysts coverage is associated with higher valuations, while Doukas et al. (2005) find that companies that received excessive analysts coverage will eventually have significantly higher of stock valuation.

The insignificant result implies that the analysts' initial reports and their accompanying recommendations are not convincing and persuasive enough to grab investors attention and raise investor optimism or their confidence. As a result, the analysts reports are not able to shift up the demand for shares that could cause share prices to trade above the fundamental value. Since there is no increase in the demand for shares, it means that the analysts reports also are not able to make investors believe that the companies participating in the incentive scheme have low degrees of information asymmetries and agency problems; hence, there is no significant change in stock valuation in the participating companies. Alternatively, the results could also imply that investors ignored the analysts reports although the reports might contain new information, and therefore no effects are observed.

Nevertheless, the results of price synchronicity are consistent with Morck et al. (2000) who find that stock prices move together more often in developing countries than in developed countries because the protection of public property rights is lacking in the developing countries. This is supported by Chan and Hameed (2006) who suggest that the macro-economic factors become more important when financial analysts examine stocks in emerging markets. Therefore, in the emerging markets the financial analysts' reports on a specific company may have less bearing than industry reports (Liu, 2004).

In summary, the result shows that there is no significant difference in stock valuation in the participating companies before and after the release of the financial analysts' reports. There is also no significant difference of stock valuation between companies

that received favourable analysts' recommendations than companies with less favourable recommendations. However, stock valuation in the control group is substantially higher than the participating companies which is due to the composition of the control group. Essentially, the release of the analysts' initial reports and their recommendations are not influential and informative to effectively have any significant impact on the valuation of companies, and therefore the null hypothesis is not rejected.

7.2.2 Effects on returns

Besides stock valuation, the research also examines the pattern of stock return of share prices around the release date of analysts. By using stock return, the measurement of return is independent of the size of investments, and therefore it is easier to compare stock returns than actual share prices (Campbell et al., 1997). A high stock return means that the investment in the stock is profitable regardless of the stock prices, and therefore stock return is used to measure the effects of the incentive scheme on prices.

We have examined stock return of companies participating in the incentive scheme and then compared with that of the control group of companies that were not participating in the scheme. A short and medium term of time series data of less than one year calendar period are used. Using a shorter time series data is consistent with the theory we discussed in detail in Chapter 3. It is because the informed traders trade aggressively and compete with each other in order to maximise their profit before prices reveal to incorporate new information; thus, the effects of corporate news on prices in general are immediately observed upon the news release (Holden and Subrahmanyam, 1992), and thus the examination of a shorter time period is more reasonable and justifiable.

Despite the difference of market valuation between the participating companies and the control group mentioned earlier, analysing the stock return between the two groups still gives comparable results. The results indicate that there are no significant differences of stock return between the participating companies and the control group. Within the participating companies, there are no significant changes in stock return prior to the event, on the event day or after the release day of the companies initial reports (see results in Section 6.4.2). Companies with favourable (buy) analysts' recommendations

also do not show significantly higher stock return than companies without favourable analysts' recommendations (see results in Section 6.5.2).

The finding is not consistent with those in previous studies. For instance Boni and Womack (2006) suggest that the significant price changes in stocks recommended by the analysts add economic value in the financial analysts reports and create high demand for analysts reports. It means investors who have more information would be able to make profit from the information. This is consistent with Kyle (1985) who argues that the informed trader would make abnormal profit from trading in the private information that he or she has in possession. However, since we do not observe any significant price change or any abnormal return upon or after the release day of the analysts' initial reports, the finding suggests that there is no private or new information or value added in the analysts reports.

The insignificant result suggests that there is no new information from the analysts' initial reports or analysts recommendations. It means that traders could not take advantage by trading in the information contained in the analysts reports. Alternatively, it is an indication that investors ignored the analysts reports although the reports contained new information. Nevertheless, the findings imply that the analysts reports and their recommendations do not have any significant effects in reducing information asymmetry or private information trading. However, it does not imply that there is no information asymmetry at all in the Malaysian stock market since the presence of information asymmetry is natural and inevitable in any economy (Stiglitz, 2003).

Results of event study in Section 6.6 suggest that there is no significant growing build-up of positive cumulative abnormal return (CAR) in the market model prior to the release of the analysts reports. Although initially it seems that there is a significant growing building-up of positive CAR prior to the event day, the examination of event study using a shorter event window reveals that the building up of CAR might be due to the effects of other events. Furthermore, the positive CAR in the long event window starts to drift and reverse several days before the event. Further investigation reveals that the event window of 30 trading days before and after the event day is the event window that has the least effects of other events. In other words, there are no other

major corporate events that take place during this period of 30 days before and after the release of the analysts' initial reports.

In particular, the event study using the short event window $[-30, 30]$ confirms that there is no significant building up of positive CAR prior to the event day. Therefore, the significantly positive CAR observed in the longer event window could be due to the effect of the combination of other major events, and not due to the effect of the analysts reports alone.

A growing build-up of CAR is an indication that investors are anticipating new information not yet released. If the market is highly efficient then there would be a clear price jump only upon the release of the news (Bodie et al., 2005). Since the study does not observe significant build up of positive CAR prior to the event or a significant price jump upon the event day, or a significant abnormal return on the event day or a day before and after the event day, it means that investors are not anticipating any new information in the analysts reports nor the analysts reports actually containing new information. Similarly, the research findings show that there are no significant changes of stock return either in the companies with favourable recommendations or in companies with less favourable recommendations. The research also does not find any significant price jump on the event day or a day before or after the recommendations.

The results of insignificance of CAR are consistent with our earlier results. Moreover, the results of event study reflect that there is no indication of leaking of information from the analysts reports or insider trading prior to the release of the reports. Meanwhile after the event day, the CAR is not statistically significance indicating that there is no new information in the event. Alternatively, it could also mean that investors ignored the reports and therefore no reactions are observed, although the reports contained new information. In either ways, the release of the analysts reports confirms the information investors have and thus there is no information uncertainty caused by the reports. As a result, there is no change of expected returns. The positive relation between information uncertainty and stock returns is documented by Zhang (2006).

In summary, the null hypotheses previously mentioned in Section 5.2.2 have been tested and the results show that there is not enough evidence to reject the null hypotheses. The

results mean that the analysts' initial reports have no significant effect on the returns of companies participating in the scheme. The favourable analysts' recommendations also do not have a significant influence in the performance of participating companies. The results imply that the analysts reports and their recommendations are not beneficial to investors and the participating companies.

7.2.3 Effects on trading activity

Even though there is no conclusive theory of trading activity nor the existence of a well-developed theory of trading volume in the financial markets, past studies show that investors can extract useful information from both volume and prices, and therefore trading volume and prices are closely related (see detailed discussion in Section 3.7).

The research empirical findings in Section 6.4.3 indicate that trading volume in the participating companies is significantly different from the control group and the differences are statistically significant from zero in the sub-period prior to, on the reports day and in the sub-period after the reports. This is due to the difference of stock valuation between the participating companies and the control group as the control group has greater valuation, hence, trading is heavier and more frequent. Despite the difference of composition between the two groups, our empirical results show that the results are still comparable as both groups have similar patterns of trading volume movement. For example, in both the participating companies and the control group, trading volume is lower in the sub-period after the event than the sub-period before the event.

In Section 6.5.3, the result shows that there is no significant changes in trading volume in the participating companies after the analysts reports are released. The result shows that trading volume in companies with favourable recommendations are not significantly different from companies with less favourable recommendations. In Section 6.8, we examine the movement of daily trading volume around the event date. The results show that trading volume is no different from normal on the event date, or a day before or after the event. Similarly, the buy and hold recommendations also do not show any significant impact on trading volume in each group of companies using the 30-day event window before and after the event.

The findings are not consistent with the previous studies of news effects on trading volume. For instance, Chakrabarti et al. (2005) find that trading volumes increase significantly and remain at high levels for companies that were added to the famous MSCI Index. The insignificant results show that there is no information content in the event and the event is not really an important event. There are two reasons often mentioned in the literature for why investors trade: firstly it is to rebalance their portfolios for risk sharing, and secondly it is to speculate on their private information (Karpoff, 1986; Llorente et al., 2002). It means that investors trade when there is a need to liquidate their investment or when new information arrives. Liquidation has no impact on investors expectation and beliefs as it happens as and when investors need to raise cash. However, the arrival of new information would likely have effects on investors prior expectation and belief of future returns, and therefore have an impact on trading.

The insignificant difference of trading volume in the participating companies after the release of analysts' initial reports implies that there is no new information that could be obtained from the analysts reports. The information on the analysts reports are not able to affect or influence investors' expectations or beliefs. Therefore, even though the results are not consistent with the previous studies, the results are still consistent with our earlier results in Section 7.2.2 in which there is no significant impact on prices. However, the results could also mean that investors ignored the reports although it is possible that there is new information in the reports. Investors ignorance could be due to their lack of knowledge in understanding the reports or investors behaviour who are usually over-confident with their own information.

Accordingly, the research indicates that the analysts favourable recommendations do not generate higher trading volume than in companies with less favourable recommendations. The results indicate that the analysts recommendations have no impact on investors' belief or expectation on the asset future value.

In summary, the null hypotheses mentioned earlier in Section 5.2.2 could not be rejected. It means that there is no substantial change in the trading volume of companies before and after participating in the incentive scheme. Companies with favourable recommendations also do not generate higher trading volume than companies with less

favourable recommendations. However, trading volume in the control group is higher than the participating companies which is due to the composition of the control group. Nevertheless, the results of insignificant effects on trading activity confirm that the analysts reports and their recommendations are not influential.

7.2.4 Effects on liquidity

Previously, Section 3.6 in Chapter 3 has discussed the importance of liquidity in the financial markets. Liquidity is an important concept as it affects asset prices (Lo et al., 2004; O'Hara, 2003). As liquidity is related to the rate of return and inventory cost (Brennan and Subrahmanyam, 1996), investors could not ignore the importance of the liquidity factor in their investment.

Since there are many dimensions of liquidity and due data constrain, the study is not capable of measuring the different aspects of liquidity. One aspect of liquidity dimensions captured in the study is the trading cost which can be represented by the bid-ask spread. The findings on the bid-ask spread in Section 6.4.4 indicate that the bid-ask spread is statistically and significantly higher in the participating companies than in the control group. This is due to the differences in the composition between the participating companies and the control group.

Despite the difference in the composition of group, the trend of the bid-ask spread in each group is very similar and closed with each other. For example, the bid-ask spread in the sub-period after the event is higher than the sub-period before the event in both groups, the participating companies and the control group. It means that within each group there is no difference of bid-ask spread between sub-periods. There is also no significant difference of bid-ask spread between the participating companies and the control group on the event day. The insignificance of the bid-ask spread suggests that the release of analysts' initial reports have no impact on reducing the costs of trading, implying that there is no impact on liquidity on the event day. In Section 6.9 we have also analysed the movement of daily bid-ask spread for each type of recommendations. For companies with the buy recommendations, there is no significant difference in bid-ask spread in most of the days in the event window. Similarly, there is no significant

difference in bid-ask spread for companies with hold recommendations.

The research finding is not consistent with the findings of previous studies. For instance, Roulstone (2003) finds that the bid-ask spread has significantly reduced when there are more analysts covering a stock, which means that liquidity has increased when there is more information provided as reflected by a higher number of analysts coverage. However, the finding in the research indicates that the analyst coverage has no effect in reducing trading cost and information asymmetry or increasing liquidity of companies that were participating in the incentive scheme.

Besides a liquidity measure based on the bid-ask spread, we have also used an illiquidity measure as suggested by Amihud (2002) and our own alternative measure of illiquidity. Basically, the illiquidity measure suggested by Amihud (2002) or our measure of illiquidity is a reflection that captures the dimension of the ease of trading. Using both measures of illiquidity reveal similar results which means that there is no clear evidence that liquidity have reduced. Effectively, the analyst initial reports have little impact in reducing the illiquidity measures as shown in Section 6.4.5.

Companies receiving favourable recommendations also do not show consistent results that the liquidity of the favourable companies have increased after the recommendations were released as shown in Section 6.10. For example, in Table 6.24 there is no significant change of stock turnover between buy and hold recommendations; similarly in Table 6.29 there is no significant difference of illiquidity measure between buy and hold recommendations. However, in Table 6.26 there is a significant difference of bid-ask spread between the buy and hold recommendations. Since stock turnover and the bid-ask spread are widely used as proxy for liquidity measure, and hence, there are no conclusive results that the favourable recommendations have significant impact on liquidity.

The findings show that the content of the analysts' initial reports and their recommendations have no substantial influence in reducing trading costs or information asymmetry among investors. As a result there is no significant change in liquidity after the companies participated in the incentive scheme.

In summary, the null hypotheses mentioned earlier in Section 5.2.2 could not be rejected. The results of insignificant effects on liquidity are consistent with our previous

results. It means that there is no difference of liquidity in the participating companies before and after the release of financial analysts' initial report. Companies with favourable analysts' recommendations also do not have higher liquidity than companies with less favourable recommendations. However, liquidity in the control group is higher than the participating companies which could be due to the composition of the control group.

7.2.5 Effects on information asymmetry

The dynamic relation between volume and returns is discussed in detail in Section 3.7. Basically, trading volume alone is not useful information. However, the series of volume and prices could be useful to investors in their trading strategy (Blume et al., 1994). We have applied Llorente et al. (2002)'s model who suggest that returns generated by hedging-motivated trades tend to reverse themselves, while returns generated by speculation-motivated trades tend to continue themselves. Trades generated for hedging are not very useful as there is no private information in the trade. However, trades generated by speculation contain private information not yet fully revealed in the prices. Therefore, a positive autocorrelation of return accompanied by trading volume is associated with a high degree of informed trading. The empirical results of the model are presented in Section 6.11.

The research findings indicate that there is no evidence of a significant difference of the degree of informed trading between the companies participating in the incentive scheme and the companies in the control group. There is also no significant difference of the degree of information asymmetry either in the participating companies or in the control group between the sub-period before and the sub-period after the event. It means that there is no significant difference of the degree of informed trading after the analysts reports were released.

We have also replicated the analysis by using a shorter time-series of 30 days before and after the event. The results are similar with a longer time-series regression that there is no significant change of the degree of information asymmetry either in the participating companies or in the control group. Accordingly, the research also does not find any significant difference in the degree of information asymmetry between companies with

favourable recommendations and companies with less favourable recommendations. In other words, the degree of information asymmetry is equal between the buy and hold recommendations.

The empirical findings are not consistent with the results of the previous studies. For instance, Durnev and Nain (2007) report that the c_2 estimates have significantly declined from 0.00674 to -0.0315 for a group of countries that have the enforcement of insider trading regulation. As the regulation of insider trading helps to reduce information asymmetry and agency problems, the decline of c_2 estimates indicates that the information asymmetry has reduced after the enforcement of insider trading regulation.

However, the empirical results of the study do not show significant difference of c_2 estimates after the event. This implies that the release of the analysts' initial reports do not have significant impacts in reducing the degree of information asymmetry. In other words, the content of the analysts' initial reports and the analysts recommendations are not informative and beneficial in reducing privately informed trading. It could also mean that although there is new information in the analysts reports, the reports are of little value due to the investors ignorance and over-confidence.

In summary, the null hypotheses previously mentioned in Section 5.2.2 could not be rejected. It means that there is no significant change in information asymmetry in the participating companies before and after the release of the financial analysts' reports. There is also no evidence of significant difference of information asymmetry between companies that received favourable analysts' recommendations and companies that received less favourable analysts' recommendations. Similarly there is no significant difference of information asymmetry between the participating companies and the control group. The results of insignificant effects on information asymmetry is also consistent with our previous results.

7.3 Research implications and suggestions

In the study, we have performed vigorous tests to investigate the benefits of the incentive scheme of financial analysts coverage. Despite the difficulty in finding the exact match

in terms of company size and the sector of industry in order to form a control group, the empirical tests of the time series data reveal comparable results between the participating companies and the control group in most of the statistical tests performed. Besides the formation of control group to compare the results of different tests, the effects of thinly traded stocks was dealt with by applying the method of estimation adjustment as suggested by Scholes and Williams (1977). Moreover, the difference between the parametric and non-parametric approaches was examined. The presence of other financially related events that might pose confounding effects was also checked and verified.

Basically, our discussions on the empirical results from Section 7.2.1 to Section 7.2.5 have answered the research questions previously outlined in Chapter 1. The empirical results of the analysis give the following summarised findings:

1. In general, the performance of the share prices of companies participating in the financial analysts coverage incentive scheme do not indicate any sign of improvement after the release of the analysts' initial reports and their recommendations. Stock returns and stock valuation do not show significant increases after the release of the analysts' initial reports and their recommendations. Similarly, trading volume, liquidity and information asymmetry generally are not significantly affected after the release of the financial analysts' reports.
2. In general, there is no significant difference of impact between companies receiving favourable analysts' recommendations and companies that received less favourable analysts' recommendations. There are no significant differences of stock valuation, stock return, trading volume, liquidity and information asymmetry between the two recommendations.
3. Although there is a difference of composition between the participating companies and the control group, in general the price movements and stock return based on time series data do not reveal significant differences between the participating companies and the control group. However, in general, trading volume and liquidity in the participating companies are significantly lower than the control group, while information asymmetry in the participating companies is significantly higher than

the control group. The significant differences could be due to the difference in composition of the groups.

Effectively, the implementation of analysts coverage incentive scheme has no impact on the stock properties of the participating companies. In particular the results show that there are no significant changes of stock returns, valuation, trading activity, liquidity or bid-ask spread upon the release of the analysts reports and their recommendations. The findings of the research offer several implications. Firstly, the research implies that the incentive scheme has no impact on reducing information asymmetry. It means that the release of the financial analyst report does not make investors become more informed or increase investors knowledge about the companies or reduce the advantage of the privately informed traders.

Secondly, the results imply that the incentive scheme has no impact on the level of private information trading. It means that the release of the financial analyst report does not change the level of insider trading as the advantage of the privately informed traders or the insiders is not affected by the analysts reports. It is an indication that the level of insider trading is not affected upon the implementation of the incentive scheme.

Thirdly, the research implies that the incentive scheme has no impact on reducing the implicit transaction costs as reflected by the bid-ask spread measure. It means that the incentive scheme is not able to reduce the cost of processing order, inventory holding and adverse selection and the level of uncertainty and the risk of trading.

Fourthly, the research implies that the incentive scheme has no impact on changing the investors opinion. It means that the analysts reports and recommendations are not able to influence investors to change their beliefs about the future value of stocks of the participating companies.

Fifthly, the research implies that the release of the financial analyst report is not an informative or an important event that has an impact on the properties of the stock of the participating companies. It means that stock price has already incorporated the information contained in the analysts reports, and therefore the information in the analysts reports is nothing new and is already in public domain. Alternatively, it is also possible that there is new information in the analysts reports, however, investors ignore

the reports because they do not understand the reports or they are over-confident with the information they have which makes them ignored the analysts reports.

Finally, the research implies that the implementation of the incentive scheme of analysts coverage is not beneficial or useful to investors or the participating companies as there are no changes of stock properties. Effectively, it means that the aims of the incentive scheme are not achieved.

Despite the inconsistent results of the empirical tests with the previous studies mentioned earlier in Chapter 3 and Chapter 4, there are few possible theories or explanations for the results. Firstly, it is an indication that the Malaysian stock market is informationally efficient as the stock prices have already incorporated the information contained in the analysts reports before the reports are released. Since there is no new information in the analysts reports, prices are left with no new information against which to respond and therefore, the impact on stock properties is not observed upon the release of the analysts reports (Bhattacharya et al., 2000). Recent studies on the Malaysian stock market show evidence that the market is relatively efficient. For example, studies by Lamba and Ariff (2006) report that the Malaysian stock market reacts immediately to the news of short selling restriction and removal of the restriction, while Salamudin et al. (1999) show that the market reacts to companies' announcement of equity issuance. Alternatively, it is an indication that the stock market may be informationally inefficient which implies that stock prices do not incorporate new information (Bhattacharya et al., 2000). It means that the information in the analysts reports is ignored and therefore the prices do not reflect or adjust to the new information disclosed in the analysts reports.

Secondly, the analysts reports do not add any economic value because the market already knew about the news in the reports and therefore the reports are ignored. It could also be that there is new information in the analysts reports but the reports are ignored because of investors' lack of knowledge. In both cases, the risk and uncertainty of the companies' prospect are not reduced or affected. As a result, the analysts are not capable of reducing the agency problem and information asymmetry between the managers and the shareholders. This is evident from the empirical results in which the proxy to measure information asymmetry do not show any significant reduction after

the analysts reports are released. As the analysts reports do not add any economic value, the demand for the analysts reports is low. This is consistent with the monitoring hypothesis which states that there is demand for the analysts reports because financial analysts add value by monitoring the performance of the companies (Moyer et al., 1989). Furthermore, investors are more cautious with the analysts reports and the analysts' favourable recommendations following the bust of the dot-com companies in the U.S. in early 2000 and the Asian financial crisis in 1997/1998.

As the contents of the analysts reports do not increase the precision of information, there is no change of adverse selection costs among investors, and therefore investors' confidence are not changed. Investors' confidence is important in attracting them to trade which means that there is no change in trading volume (Blume et al., 1994). As the analysts reports do not have any new information that can change investors' expectation and beliefs, investors are not influenced to trade, hence, trading volume is not affected (Karpoff, 1986). It is evident from the empirical results in the study that there is no significant change of trading volume observed in the participating group upon the release of the analysts reports and their recommendations.

Thirdly, the contents of analysts reports may already have been anticipated by investors, hence the release of the analysts reports is not a surprise event (Bhattacharya et al., 2000). Since the contents of analysts reports have been anticipated, there is no change in the number of uninformed or informed traders. Previously, in Chapter 3 we have discussed that the increased informed traders will result in prices becoming more informative. Since there is no change in the number of informed traders, there is no change in the informativeness of price. As the informativeness of price does not increase, the expected loss of uninformed traders when they trade with the informed traders is not reduced. As a result, the bid-ask spread does not change and liquidity is not affected, which is consistent with the liquidity hypothesis (Irvine, 2003). This is reflected on our empirical results in which there are no significant changes of stock valuation, stock return, bid-ask spread and liquidity.

Finally, Bhattacharya et al. (2000) argue that the insignificant impact of news could be due to a lack of enforcement of insider trading. The lack of investors protection

from the management and insiders abuse also affects the behaviour of financial markets (La Porta et al., 1997, 1998). It means that investors in the Malaysian stock market may have the perception that investors are not properly protected or the rules of law are not strongly enforced. As a result, investors may have the view that the companies are hiding important information from investors and therefore investors are more cautious in following the analysts recommendations.

We offer five possible reasons why the market may judge the analysts reports contained little value and therefore are not influential nor informative in the market. Firstly, the career as financial and equity analysts in the financial market is relatively new in the Malaysian market. As the Malaysian capital market started to grow, the demand for the financial analysts also started to increase since the early 1990s. Due to the relatively small and new emerging market, the quality of business journalism and their reports may be viewed relatively low compared to the developed markets. Consequently, the analysts reports are largely ignored and judged contained no fresh news or significant information.

Secondly, there is no organisation that monitors the performance of the analysts, and therefore the credibility of the analysts is not being verified (see Chapter 2 for discussion of analysts role in the Malaysian stock market). For example, Desai et al. (2000) report that the WSJ evaluates the performance of stock recommendations of senior analysts at a large number of brokerage houses over the previous calendar year and ranks each analyst within each industry by that performance. The top five performers in each industry is termed 'all-star'. The WSJ publishes the survey every year and this provides evidence of analysts credibility. Due to the lack of credibility, Ang and Ma (2001) report that in the period of extreme financial crisis in 1997/98 in Indonesia, Korea, Malaysia, and Thailand, they find a disconnection between the financial analysts and the stock market in the sense that the financial analysts did not influence the market before the crash, or be influenced by the market after the crash.

Thirdly, the analysts' initial reports are freely available from the Internet via the stock exchange's website. In usual practise, investors have to subscribe to the brokerage newsletter or to pay some money to have access to the analysts' company report from any information service vendors available in the market. As a consequence, investors may

regard the free analysts reports as low quality information, and thus have no informative value. For example, Shapiro (1968) suggests that people view high price product or service positively associated with the quality of the product or service. It means that a low price product or service usually signals the product's or service's low quality, especially when the product or service is difficult to judge on a basis other than price. Therefore, as it is also difficult to assess the quality of analysts reports other than the future performance of the analysts, investors might view the analysts reports of companies participating in the incentive scheme a low quality product and therefore the reports are largely ignored by investors.

Fourthly, trading orders in the Malaysian stock market are dominantly generated from individual and retail investors. Usually they have low capital upfront and therefore their trading are mainly gambling, speculative and short term in nature. As many of them are less sophisticated investors, most of their trades are motivated by short-term gains and their trading are sometimes irrational. Therefore, investors have little knowledge about understanding the analysts reports. Moreover, most investors are over-confident with the information they have and that caused the research reports to be largely ignored.

Finally, most of the companies listed on Bursa Malaysia are controlled and managed by the largest shareholders of the companies or controlled by family business. Following the Asian financial crisis in 1997/98 and the bust of dot-coms companies in early 2000, there is a lack of trust among investors in the analysts' recommendations as they always fail to send early warning to investors. Moreover, as the companies are tightly controlled by the owners, the disclosure policy of the companies may be selective or restrictive in providing information to the public, and therefore the analysts reports may be viewed of little value and ignored by investors.

7.4 Policy implications

It appears in the literature that in the long run analysts coverage is beneficial and useful to bridge the gap of communication between investors and companies. Investors rely on financial analysts to provide information on companies and recommendations of stocks,

while companies rely on financial analysts as a mean of promoting the companies. The implementation of the incentive scheme of financial analysts coverage that was initiated by Bursa Malaysia is an approach to increase company research. According to the 2007 annual report of Bursa Malaysia, there is demand from investors for the research reports produced by financial analysts that are participating in the incentive scheme. Due to the positive response from investors, the second phase of incentive scheme has already commenced in November 2007 and the scheme is going to operate for another two years (Bursa Malaysia, 2007). The continuation of the second phase of the incentive scheme reflects the relevance of the scheme and the willingness of all parties involved to continue to participate in the scheme.

However, the research reveals results that are not consistent with the literature and do not agree with the objectives of the incentive scheme. In short, the study finds that the incentive scheme has no impact on stock properties of companies that are participating in the incentive scheme, particularly, the stock valuation, returns, liquidity and bid-ask spread, hence the incentive scheme should be scrapped unless a few changes can be made. The research offers a few policy implications to Bursa Malaysia and other relevant authority.

First, Bursa Malaysia should undertake proactive measures in promoting and increasing the awareness of the importance of information among investors. It means that investors should learn and educate themselves how to read and understand companies' annual reports and balance sheets as well as companies' research reports so that investors can have better understanding about the risk of their investment. Events such as trade exhibitions, conferences, forums and seminar on investment will be useful for investors to gain further knowledge. The using of mass media such as newspaper or radio and television by the authority could also helpful in providing more information to the public. The continuous efforts to educate investors will eventually result in the financial analysts reports receiving greater attention from investors. As the prevalence of less sophisticated investors in the Malaysian stock market is imminent, the study finds that the authority should launch more campaigns of awareness to educate investors so that investors will become more sophisticated that enable them to read and understand the research reports.

Second, Bursa Malaysia should promptly alert and inform investors about the new release of the financial analysts reports. A greater publicity is important to attract investors attention on the arrival of the new analysts reports so that the reports will not be ignored. The publicity exercises can be done through the website of Bursa Malaysia, brokerage companies, newspaper advertisement or other means of communication. The reports should also be easily accessible either online or at the offices of Bursa Malaysia, participating companies and brokerage companies. This is important as the timing of the arrival of the news can affect prices and the execution of trades.

Third, the quality of analysts reports should be improved by adding more information because the current analysts reports were relatively short. It means that the participating companies should be able to disclose more discussion and information such as the quality of their asset. Similarly, the financial analysts should be more competence to analyse in detail the information given to them and provide more meaningful and insightful company's research reports. A detailed analysis of the companies' prospect will add economic value and increase demand for the analysts reports. In a similar spirit, the quality of the analysts reports produced by the financial analysts can be enhanced by providing continuous training to the analysts.

Fourth, Bursa Malaysia should encourage companies to disclose material information to the public and the information should be promptly disseminated. Bursa Malaysia should also be able to enforce companies to disclose material information so that insiders will not be able to take advantage of their private information and the risk of trading of the uninformed traders will be reduced.

Fifth, Bursa Malaysia and the relevant authority should increase and strengthen the enforcement of prohibition of insider trading. Although the authority has already executed several cases of breaches of compliance in the Malaysian stock market (Bursa Malaysia, 2007), the results of the study suggest that the enforcement of rules and regulations that protect minority shareholders rights is perceived to be not sufficient. It means that the relevant authorities have to improve the enforcement of compliance so that investors protection is continuously maintained. A strong legal enforcement and property rights will protect investors and, therefore, reduce the risk of trading of shares

in the stock market.

Sixth, the performance of the financial analysts should be continuously monitored and publicly disclosed so that the credibility of the analysts' recommendations and forecast can be verified and evaluated. The monitoring of financial analysts provides incentive for the improvement of the quality of analysts reports.

Seventh, Bursa Malaysia should examine and monitor the facilities of trading credit so that investors will not abuse the financial system by taking too much credit. As investors are usually over-confident with the information they have, the monitoring of credit risk will reduce the impact of unforeseen circumstances such as financial crisis.

Finally, assuming that the analysts reports are now of high quality, Bursa Malaysia should charge a minimal fee to investors who would like to receive alert message about the arrival of the new analysts reports. The alert message will prompt investors to act accordingly. The small fee payable by the traders will provide incentive to traders to promptly act upon the arrival of the analysts reports. However, the analysts reports are still freely available for investors.

7.5 Summary

The results demonstrate that in the short to medium term period the financial analysts research incentive scheme do not have a significant impact on companies that are participating in the incentive scheme. The analysts' initial reports are not able to raise investors' confidence or influence investors. Hence, the analysts reports do not add economic values that are beneficial to investors, companies and other market participants. In essence, the release of analysts' initial reports do not have an impact in reducing information asymmetry. This chapter offers possible reasons for the insignificant results which include, among others, a lack of new information in the reports, investors irrational behaviour and lack of investor rights and protections. This chapter also suggests a few policy implications that could be undertaken by the authority. The following chapter will conclude the study's contribution, limitations of the study and potential future research.

Chapter 8

Conclusions

8.1 Introduction

This final chapter concludes the research effort by presenting a final discussion of the overall thesis chapters. As the implementation of the incentive scheme of financial analysts research is relatively new in any financial markets, it provides a natural setting to study the impact of the scheme on stock properties. To our knowledge, there is no published research that investigates the effects of the financial analysts coverage in a developing market like the Malaysian stock market. Therefore the findings of the research could contribute some insights to the existing finance literature as well as enlightening policy makers in the financial markets. This is followed by a discussion of the limitations of the study and suggestion for future research.

8.2 Research summary

The main objective in the research endeavour is to investigate and examine the effects of the financial analysts coverage particularly among companies that were participating in the incentive scheme of financial analysts research which was initiated in the Malaysian stock market in 2005. In order to accomplish this objective, the model of price formation under the presence of informed trader suggested by Kyle (1985) is examined. Based on the seminal Kyle's model and extension of the Kyle's model, variables such as the stock

market valuation, return, trading volume, bid-ask spread and market depth or price impact are important variables that could be used as proxy to measure the effects of financial analysts coverage under the assumption of the presence of information asymmetry. Another proxy suggested by Llorente et al. (2002) is used to measure the degree of private information trading.

In order to measure the effects of financial analysts coverage we use the analysts' initial reports as the important document produced in initiating the analysts coverage. Therefore, the release day of the analysts' initial report is considered an important event in the analysts coverage. Several hypotheses have been developed and tested against a control group. After screening out companies, we obtain a clean and reliable data of 55 companies that are participating in the incentive scheme. Although we do not manage to obtain the exact match and the same number of companies with the sample companies in the participating group, we manage to get a clean and reliable data of 50 companies matched by industry that are not participating in the incentive scheme to be included in the control group.

We compare the statistics obtained from the participating companies with that of the control group. Data is divided into three sub-periods, namely, before the event, event day and after event. The t -test, analysis of variance and multiple mean comparisons procedures are performed. Event study method is applied in order to measure and examine the movement of variables on a daily basis, so that we are able to pinpoint to the day when the significant results occur. The presence of other events that might interfere results of event study method is also checked. The use of a non-parametric approach in the event study is also examined.

In general, there is not enough evidence to suggest that the incentive scheme of the financial analysts research is beneficial and helpful to investors. The study does not find any significant differences in various measures and statistical tests that have been performed between the participating companies and the control group. The results show evidence that the analysts reports and recommendations are valuable only in certain economies and not in every market. Although the research implies that the initiation of financial analysts does not add economic values to the companies, in the long run

the initiating of analysts coverage might be considered an important measure to reduce information asymmetry as evident from previous studies on the developed markets.

8.3 Research contribution

The research contributions are divided into two parts, that is the empirical and policy aspect. In terms of empirical approach, the study has provided evidence that not every analysts reports and recommendations are closely followed in the market. Using data from one developing country, the research results are not consistent with previous research that were mostly performed in the developed markets. The research suggests that the findings from a research in a developing country could produce a different result from a conventional point of view. This is consistent with the view of Bekaert and Harvey (2003) who suggest that the different circumstances in the emerging market could explain the reason why the using of standard model in emerging markets gives different results.

The study have used two of the most widely used models of abnormal return in the event study method among academicians and practitioners, that is the market model and the market-adjusted return model. The results do not show significant difference such as shown in Figure 6.3 and Figure 6.5 where both figures are based on a different methods of calculating abnormal return. We have also examined the results of event study method using a non-parametric approach. We have shown in Section 6.6.5 that the non-parametric approach reveal similar results with the parametric approaches despite a lower frequency of detecting abnormal performance based on the event window $[-30, 30]$. In general, the parametric approach is well-specified in detecting the presence of abnormal performance.

We have also examined the prevalence of clustering effects as we briefly mentioned in Section 6.4.2. The research confirms that the using of a common date could lead to the clustering effects, and therefore future research using the event study method should verify and examine the clustering effects. Similarly, the existence of other important events that might occur during the same event window is examined and verified. Using a different event window, the research is consistent with the literature that the examination

of the confounding effects is important in the event study method as it could unveil a different result.

In the measure of market illiquidity, the research has introduced a new alternative measurement initially proposed by Amihud (2002). Amihud does not consider using turnover as he wants to measure net order flow, and therefore raw trading volume would be more representative. The research has replicated the analysis using turnover to measure stock illiquidity, thus, the research contributes to providing alternative measurements of illiquidity even though the difference between the two measures is very minimal and not significant.

In terms of contribution to the policy aspect, the research provides evidence that the financial analysts' coverage itself is not sufficient to increase the promotion and trading of shares of companies that are participating in the incentive scheme. The study offers policy implications for Bursa Malaysia and other relevant authorities. For instance, efforts such as frequent and continuous voluntary disclosure or a brief update of recent corporate development submitted by the companies themselves could help investors to become more informed, thus reducing the presence of a privately informed trader. Therefore, an increase of and promptly disclosure are suggested. An increase of publicity of the release of financial analysts reports is also suggested in order to attract investors attention to read and analyse the research reports. The publicity of the research reports will help investors to educate themselves to become sophisticated investors, and do not follow on rumours. The rights and protection of minority investors are highly essential to attract and influence investors. Without a proper protection and enforcement of law, investors are exposing themselves to high risk. A risky investment environment would ultimately lead to the decrease in trading of shares, stock liquidity and an increase in trading costs. Therefore, a strong investor protections and law enforcement are suggested.

8.4 Research limitation

As with any research, the research findings should be interpreted with some caution based on several limitations. However, necessary remedial actions have been taken to minimise

the possible effect of these limitations. Firstly, there is always the issue of generalisation and aggregation of statistics in each company. As this study used data from the Malaysian stock market, the generalisation of the findings to other countries may be limited as we have shown in the previous chapter.

Secondly, the source of the data is from a third party information service provider. As the research has found out in Chapter 6, there is evidence that the reliability of some data is questionable due to the occurrence of extreme values and incomplete data.

Thirdly, the period covered in the data is only for a few months after the event. A longer time-series could possibly provide different findings with different interpretation as there would be more events of analysts reports to be included. The number of companies included in the study is also limited.

Fourthly, the variables that are included in the data is limited to transaction data only. Some important data such as the number of transactions could also be useful, as well as accounting data such as earnings forecast. This has put constraints in testing other models of price formation.

Fifthly, the composition of companies in the control group is not perfectly matched with companies in the participating group. Therefore the effects of company's size and value are not directly measured. Although the problem is inevitable, a closer match between the participating companies and the control group would be more ideal. Moreover, the sample companies voluntarily applied to participate in the incentive scheme, and therefore there is a problem of self selection biased among the sample companies.

8.5 Future research

The research limitations mentioned above suggest fruitful directions for future research. Firstly, as the research covers only the analysts' initial reports, other factors associated with analysts coverage must be explored and included in a more complete theoretical model. Specifically, future research could add company's earning or other transactions data and relate analysts coverage with the degree of information asymmetry. Future research could also seek to further extend the model of price formation under informed

trading to include more constructs.

Secondly, future research could also expand the analysis by using a longer time span so that the effect of longer holding period could be investigated, as well as to increase more sample of companies participating in the incentive scheme and more number of events. Furthermore, multiple points of analysts reports could be used to measure the aggregate effects of analysts coverage.

Thirdly, future research could also investigate the content of analysts reports of companies that do not participate in the incentive scheme, particularly companies that are followed by the analysts outside the incentive scheme. Further theoretical models to measure the quality of the analysts reports would also be helpful in determining which analysts reports are better in quality.

Finally, standard finance models is relatively new that it could not generally explain the other markets that have different circumstances such as the emerging markets, and therefore advance research should be embarked in searching for better theoretical models.

8.6 Concluding remarks

The rapid growth of the Internet usage is imposing profound impacts on the financial markets. Nowadays, besides the printing formats such as newspapers, business magazines and investment newsletters, the electronic formats such as e-mails and the Internet chat-rooms are another source of information which could drive investors unsure and doubtful of the reliability of the news. Nevertheless, investors and traders alike need to be informed before they can make their investment decision.

The reliance on the financial analysts to provide a company's report and investment recommendation is still plausible as investors need a reliable analysis and information. However, if the analysts reports do not have new information or deeper insight, then there is no economic value added in the reports that is beneficial to the company, the investors. Eventually, the analysts reports would be ignored.

In the research, we find that the Malaysian stock market do not respond to the analyst initial reports of companies that are participating in the incentive scheme of analysts

coverage. In other words, the incentive scheme do not have any significant impact on the companies that are participating in the scheme. We have tested vigorously the comparison of means and the event study methods by using different estimation period and methods. We have also tested using different proxy of measurements. The findings of the research are not consistent with past studies which are mostly based on the developed markets.

Despite the evidence pointing to the lack of success of the financial analysts coverage, in the long run the analysts coverage could be informative and influential to investors if the analysts could unveil the company's prospect they are covering and deliver them to investors as timely as possible. Meanwhile, the authority should exercise more publicity and campaign to attract investors attention and to ensure that the shareholders' rights are legally protected and the rules and regulations are strongly enforced.

Appendix A

Appendix

A.1 List of sample of participating companies and control

<u>Participating companies</u>	<u>Control</u>
1 ACPI	1 AFFIN
2 AIRPORT	2 AMMB
3 AKN	3 ANNJOO
4 AKNMTEC	4 APM
5 ATIS	5 BERNAS
6 BOLTON	6 BOUSTEAD
7 BSA	7 BRAYA
8 CBIP	8 CHHB
9 CRESC	9 CRLSBG
10 DELLOYD	10 DAIBO
11 DRBHCOM	11 DAIMAN
12 ENKAH	12 DLADY
13 FAREAST	13 EKOVEST
14 HIAPTEK	14 ESSO
15 HTECHPADU	15 GENTING
16 HUNZAPTY	16 GHOPE
17 JERNEH	17 GLOMAC
18 KENMARK	18 GUTHRIE
19 KILHALL	19 HAPSENG
20 KMLOONG	20 HUME
21 LEWEKO	21 IGB
22 MAYBULK	22 INGRES
23 MEASAT	23 KIMHIN
24 MEGAN	24 KJOO
25 MESIN	25 KLK
26 METROKAJ	26 LIPO
27 MIDF	27 LONDON
28 MNRB	28 MAA
29 NAIM	29 MAGNUM
30 NARRA	30 MAYBANK
31 NCB	31 MELEWAR
32 NPC	32 MFLOUR
33 PARAMON	33 MIECO
34 PETGAS	34 MPI
35 PGARDEN	35 NST
36 PLENITUDE	36 OSK
37 PPB	37 OYL
38 PRINSIP	38 PADINI
39 RUBBER	39 PROTON
40 SAB	40 SAPIND
41 SOP	41 SEG
42 SPURATEC	42 SELOGA
43 SUIWAH	43 SPSETIA
44 SUNINC	44 STAR
45 TALAM	45 SUNRISE
46 TALI	46 SUPERMAX
47 TAS	47 TELEKOM
48 TEXCHEM	48 TRANSMILE
49 TIENWAH	49 UNISEM
50 TOYO	50 WCT
51 ULI	
52 UPA	
53 VADS	
54 VS	
55 YUNGKONG	

A.2 Financial analyst's initial report: sample 1



Initiating Coverage

Analyst: Penny Yaw, CFA
penny@AffinSecurities.com.my

Date: 15 April 2005

Malaysia Airports Holdings Bhd		Price:	RM 1.67
		Market Capitalisation:	RM1,837.0
		Board:	Main Board
		Sector:	Trading Services
Stock Code:	5014	Recommendation:	HOLD

<u>Key Stock Statistics</u>	2004	2005F
EPS (est.)	11.6	12.0
P/E on EPS	14.4	13.9
Dividend/Share	2.0 sen *	
NTA/Share (RM)	2.27	
Book Value/Share	2.27	
Issued Capital (mil shares)	1,100	
52-weeks Share Price Range	RM1.30-1.80	
<u>Major Shareholders:</u>		
Minister of Finance (MOF)	49.3%	
Khazanah Nasional Bhd	23.5%	

* An estimate – Announcement on dividend for FY04 will be made later this month.

<u>Per Share Data</u>	2002	2003	2004	2005F
Book Value (RM)	2.12	2.17	2.27	2.37
Cash Flow (sen)	19.6	13.3	19.4	19.6
Earnings (sen)	13.7	7.7	11.6	12.0
Dividend (sen)	8.0	2.0	2.0	2.0
Payout Ratio	0.58	0.26	0.17	0.17
PER (x)	12.2	21.7	14.4	13.9
P/Cash Flow (x)	8.5	12.6	8.6	8.5
P/Book Value (x)	0.8	0.8	0.7	0.7
Dividend Yield (%)	4.8	1.2	1.2	1.2
ROE (%)	9.6	6.4	8.1	8.1
Net Gearing (%)	n/m	n/m	n/m	n/m

<u>P&L Analysis (RMmil)</u>	2002	2003	2004	2005F
Year-end: Dec				
Revenue	935.3	894.0	1,015.6	1,059.6
Operating Profit	286.5	213.1	284.0	289.9
Depreciation	(70.1)	(64.9)	(96.6)	(98.7)
Net int income/(exp)	3.6	3.9	0.0	5.3
Share of assoc's profit	1.8	(0.4)	10.1	10.0
Pre-tax Profit	221.8	151.6	197.5	206.5
Taxation	(71.0)	(66.9)	(70.3)	(74.4)
Net Profit	150.8	84.7	127.2	132.2
Operating Margin	31%	24%	28%	27%
Pre-tax Margin	24%	17%	19%	19%
Net-Margin	16%	9%	13%	12%
Effective tax rate	32%	44%	36%	36%

1. Investment Highlights/Summary:

- The first airport group to be listed in Asia, Malaysia Airports Holdings Bhd (MAHB) is poised to benefit from the expected rise in air travel.
- Expect stronger passenger movement with a new RM100m Low Cost Carrier (LCC) hub at the KL International Airport (KLIA), operational by 2H 2006.
- Potential improvement in non-aeronautical revenue in the form of retailing and advertisement of its facilities.
- Initiating coverage with a HOLD, but there is scope for a re-rating on the back of an impending value enhancing restructuring, involving its concession terms, namely:
 - An RM847m concession fee still owing by MAHB to the Government of Malaysia (GoM), accumulated since 2001 but which ended in 2004. Out of the total, RM389m is expected to be set-off with the proposed disposal of Sepang International Circuit Sdn Bhd (SIC) to GoM.
 - A restructuring of the passenger service charge (PSC), and annual lease payments to GoM (which started in 2004) for the use of KLIA.

2. Background:

• Corporate Profile

MAHB is the primary operator and manager of Malaysia's 38 airports (19 airports and 19 short take-off and landing ports). It carries the 50-year concession for the KLIA, and 30-year concession for the other airports ending in 2048 and 2022 respectively.

• Corporate Structure

Refer to APPENDIX 1

• Business

The Group's core business activities include:

- Aeronautical services such as the development, management & maintenance of Malaysia's 38 airports (including KLIA), and airport management services for the Phnom Penh and Siem Reap International Airports in Cambodia via a joint-venture arrangement with Aeroports de Paris Management S.A.
- Non-aeronautical activities such as the management of duty free and non-duty free outlets, hotels, food & beverage services, free commercial zones, plantations, auction centre and the Sepang F1 circuit.

Aeronautical activities contributed 50% to group turnover in FY04, and it came mainly from passenger services charges, and aircraft landing fees.

3. Valuation:

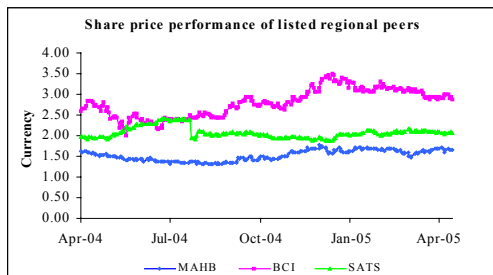
<u>Comparative Valuation</u>	<u>MAHB</u>	<u>AOT*</u>	<u>BCI^</u>	<u>SATS</u>
Share Price (RM) @ 14 April 2005	1.67	45.75	2.88	2.07
Mkt. Cap (RM mil)	1,837.0	65,358.5	3,870.2	2,127.7
Ave. Daily Vol. ('000 shares)	208.5	1,544.2	7,480.5	267.5
P/E FY03 (x)	21.7	11.7	14.9	10.8
P/E FY04 (x)	14.4	11.1	13.3	9.9
P/NTA (x)	0.7	1.1	1.4	2.1
Yield (%)	1.2	2.6	3.1	3.0

* AOT - Airports of Thailand Public Co Ltd

^ BCI - Beijing Capital Intl Airport Co Ltd

` SATS - Singapore Airport Terminal Services Ltd

Share Price Chart of MAHB, BCI and SATS



4. Earnings Outlook:

After achieving a strong passenger traffic growth of 17.8% in FY04 (from a 1.5% decline in FY03 due to SARS), we expect a moderate growth of 5% for FY05, on the back of normalisation in air travel and slower economic growth globally. Earnings growth for its aeronautical services may be stronger, depending on its negotiations with the GoM on PSCs and lease rentals.

As for its non-aeronautical activities, we have conservatively forecast a 5% pretax growth for its retail business. However, we have not factored in potential margin expansion from its retail business driven by economies of scale via the plan expansion or more efficient utilisation of available retail space in the airports.

Overall, we expect a more subdued earnings growth of 4% in FY05 coming from a higher base in FY04 (EPS growth of 50% y-o-y).

5. Recent Developments:

A dedicated RM100m LCC terminal is being constructed at KLIA and is expected to be operational in 2H 2006. Upgrades are also currently progressing at the KLIA to cater for the new wave of A380 aircraft.

MAHB will also build a 2nd satellite building at the KLIA. Construction works will start within the next 2 years and the building is expected to be operational by 2008.

Elsewhere, MAHB is in the process of upgrading its airport in Alor Star and has plans to upgrade airports in Terengganu, Kuching and Kota Kinabalu.

6. Investment Risk:

Under the terms of the KLIA Concession Agreement signed between Malaysia Airports (Sepang) (MA Sepang), a 100%-subsidiary of the Company which is involved in the management and operation of KLIA, and GoM, MA Sepang is obliged to make several lease payments to the GoM with regards to KLIA, commencing from 2004:

- RM60m in annual fixed lease rental (increasing by 4% per year); and
- A variable lease rental based on 8% of the revenue of MA Sepang.

The GoM has agreed for the above-mentioned lease rental charges to be temporarily suspended until a new scheme of arrangement is formulated. This is pending the on-going negotiations between GoM and the Group. The strength of the Group's near-term cashflows are dependent on the outcome of these negotiations.

7. Balance Sheet:

<u>Balance Sheet and Other Financial Data (RM mil)</u>	<u>FY2002</u>	<u>FY2003</u>	<u>FY2004</u>
Total Assets	3,281.3	3,554.6	4,075.8
Fixed Assets	2,519.9	2,696.6	2,914.1
Current Asset	637.3	734.5	1,038.4
LT Assets	124.1	123.6	123.3
Current Liabilities	375.9	352.7	495.6
LT Liabilities	470.0	713.6	960.5
Share Capital	1,100.0	1,100.0	1,100.0
Shareholders Funds	2,335.3	2,388.3	2,499.7

The Group is in a net cash position of RM314.4m as at end-Dec 2004. However, included in other long-term liabilities is an amount of RM847m being the balance of the KLIA concession fees, for the period 2001 to 2004.

8. Recommendation

P/E valuations are presently fair vs. its regional peers. We believe there is room for a re-rating of MAHB on the back of the outcome of its negotiations with the GoM and we await the results. Meanwhile, we initiate coverage on MAHB with a HOLD recommendation.

APPENDIX 1

Malaysia Airports Holdings Bhd		
100%		Malaysia Airports Sdn Bhd
100%		Malaysia Airports (Sepang) Sdn Bhd
100%		Malaysia Airports (Niaga) Sdn Bhd
100%		Malaysia Airports Management & Technical Services Sdn Bhd
100%		Malaysia Airports (Properties) Sdn Bhd
100%		Malaysia Airports (Technologies) Sdn
100%		MAB Agricultural Horticulture Sdn Bhd
100%		KL Airport Hotel Sdn Bhd
100%		Asia Pacific Auction Centre Sdn Bhd
100%		Sepang International Circuit Sdn Bhd
49%		Urusan Teknologi Wawasan Sdn Bhd
40%		Cambodia Airport Management Services Ltd
20%		Kuala Lumpur Aviation Fuelling System Sdn Bhd

This report is for information purposes and has been prepared by Affin Securities based on sources believed to be reliable. We however do not give any guarantee as to the accuracy or completeness of the information provided. Any opinions or estimates in this report are that of

A.3 Financial analyst's initial report: sample 2

Initial Coverage



MALAYSIA EQUITY RESEARCH

15 April 2005

PPB Group Bhd

RM6.75

Market Cap: RM4,001.1m

Board: Main Board

Sector: Consumer Products

Stock Code: 4065

BUY

Fair value: RM8.00
(RM4.00 ex-Bonus Issue)

Key Stock Statistics

	2005E	2006F
EPS (sen)	33.1	33.6
PER (x)	10.2	10.0
Dividend/Share (sen)	30.0	30.0
NTA/Share (RM)	3.41	3.50
Book Value/Share	3.43	3.53
Issued Cap. (m shares)		592.7
52-Week Price Range	RM2.80 -	RM1.98
Major Shareholders:		
Kuok Brothers		41.43%
PNB		4.22%
Nai Seng Sdn Bhd		4.16%

1. Investment Highlights

- PPB Group, the flagship umbrella for Tan Sri Robert Kuok's business in Malaysia, is one of the largest conglomerates listed on Bursa Malaysia.
- The group has grown from its initial business of cane cultivation and sugar refining to managing a diverse business portfolio which includes oil palm plantations, edible oils refining, grains trading, flour and feed milling, livestock farming, packaging, property, film exhibition and waste management and utilities.
- PPB's oil palm plantation business, held under PPB Oil Palms which is also listed on Bursa Malaysia, remains the largest earnings contributor for the group.
- Going forward, the group will spend on improving operational efficiencies and will be on the lookout for new profitable business ventures.
- Total capex of RM410m has been budgeted for FY05, where a large portion is dedicated to PPB Oil Palms for the construction of mills and plantation development.
- We arrive at a fair value of RM8.00 for PPB's shares based on RNAV valuations, which implies a PER05 of 12.1 and a P/BV of 1.2x
- Dividend yield is attractive at 4.4% given the increase in dividend payout of 30.0 sen in FY04.

Per Share Data

FYE 31 December	2004A	2005E	2006F	2007F
Book Value (RM)	6.68	6.87	7.07	7.27
Op Cash Flow per share (RM)	0.75	0.85	0.73	0.80
EPS (sen)	67.6	66.2	67.2	67.8
DPS (sen)	30.0	30.0	30.0	30.0
Payout Ratio (%)	44.4%	45.3%	44.6%	44.3%
PER (x)	10.0	10.2	10.0	10.0

P/Op Cash Flow (x)	9.0	7.9	9.2	8.5
P/Book Value (x)	1.0	1.0	1.0	0.9
Dividend Yield (%)	4.4%	4.4%	4.4%	4.4%
ROE (%)	10.1%	9.6%	9.5%	9.3%
Net Gearing (x)	Net cash	Net cash	Net cash	Net cash

Per Share Data

FYE 31 December	2004A	2005E	2006F	2007F
Revenue	10,999.7	12,449.9	13,811.1	15,073.5
Operating Profit	759.3	826.6	842.1	852.2
Depreciation/Amortisation	(145.9)	(165.3)	(171.0)	(176.6)
Interest Expenses	(15.1)	(13.7)	(12.8)	(11.6)
Pre-tax Profit	733.5	697.5	708.4	714.0
Taxation	(183.8)	(174.4)	(177.1)	(178.5)
Net Profit	400.7	392.4	398.5	401.6
EBITDA Margin	6.9%	6.6%	6.1%	5.7%
Pre-tax Margin	6.7%	5.6%	5.1%	4.7%

This report is for information purposes only and under no circumstances is it to be considered as an offer to sell or a solicitation of an offer to buy any securities referred to herein. The information contained herein has been obtained from sources believed to be reliable but such sources have not been independently verified and consequently no representation is made as to the accuracy or completeness of this report and it should not be relied upon as such. This company and/or its directors may have interests in the securities referred to herein. Any opinions or recommendations contained herein

2. Background

PPB Group has grown from its initial business of cane cultivation and sugar refining into one of the largest conglomerates in Malaysia. It is listed on the Bursa Malaysia with a market capitalisation in excess of RM4.0b. The group was incorporated in November 1968 and was subsequently listed on the stock exchange of Kuala Lumpur and Singapore in May 1972. PPB Group (previously known as Perlis Plantations Bhd) is the flagship umbrella for Tan Sri Robert Kuok's business in Malaysia. He also owns Jerneh Asia Bhd which carries out insurance business.

PPB's main business portfolio includes the following:

- sugar and cane manufacturing
- oil palm plantation
- edible oils refining
- grains trading, flour and feed milling
- livestock farming
- packaging
- property
- film exhibition
- waste management and utilities

Business Segment

a. Sugar and Cane Manufacturing. The group's sugar operations are undertaken by its wholly-owned subsidiary, Malayan Sugar Manufacturing Company Bhd (MSM), which was acquired in 1976, and 50% associate Kilang Gula Felda Perlis Sdn Bhd (KGFP). The group's involvement in the sugar industry started as early 1968 with the cultivation and milling of sugar cane in a 4,350 hectare cane plantation in Chuping, Perlis. KGFP, a joint venture between PPB and FELDA, was established to cultivate cane on an adjoining 4,000 hectares of land and to own and operate an integrated sugar mill with a milling capacity of 5,500 tonnes of cane per day and a refinery with a melting capacity of 650 tonnes of raw sugar per day to process cane from both plantations. Jointly, MSM and KGFP produce more than 650,000 tonnes of refined sugar per annum.

MSM's sugar refinery at Prai, Province Wellesley started operations in 1964 and has become the region's largest sugar refinery with a melting capacity of 2,000 tonnes of raw sugar per day. MSM produces various types of sugar for industrial and household consumption. Its customers consist of major food and beverage industries, confectionaries, hotels, restaurants, food outlets and household consumers. MSM, together with KGFP, supplies approximately 60% of Malaysia's domestic sugar requirements.

PPB's sugar business is the second largest earnings contributor to the group after its oil palm plantation business.

b. Oil Palm Plantation. The plantation business is undertaken through PPB's 55.6% subsidiary, PPB Oil Palms, which is also listed on Bursa Malaysia. PPB's involvement in oil palm cultivation began in 1986 through the establishment of Saremas Sdn Bhd to develop an oil palm plantation in Sarawak. Subsequently, it acquired a 60% stake in Sapi Plantations Sdn Bhd to develop an oil palm plantation in Sabah. In 1995, the group expanded its oil palm plantation business in Indonesia with the acquisition of a 70% equity interest in PT Tidar Sungkai Sawit.

Today, PPB Oil Palms has 21 plantations in East Malaysia and Indonesia with a total plantation landbank of 210,788 hectares and operates 8 crude palm oil mills with a total processing capacity of 1.8m tonnes of FFB per annum.

Though not the largest revenue generator for the group, the plantation business remains the main earnings contributor. Based on group operating earnings of RM620m for FY04, approximately 36% came from the oil palm plantation business.

c. Edible Oils Refining. The edible oils refining operations are held by its wholly-owned subsidiary, PGEO Group Sdn Bhd (PGEO). PGEO was formed in December 2000 to consolidate the edible oils refining operations of FFM Bhd and PPB Oil Palms Bhd. PGEO's operates an integrated edible oils manufacturing business, with activities ranging from the conversion of crude oils into refined oil products to the marketing of refined oil products for international markets.

PGEO has one of the largest refining capacities in the country of 11,700 tonnes per day with six refineries in Peninsular and East Malaysia. The group refines over 3m tonnes of edible oils per annum and exports about 90% to overseas markets such as India, China, the EU countries, Middle East and Pakistan. PGEO is also involved in soybean and palm kernel crushing, drums manufacturing, consumer packaging and downstream activities which includes the production of shortening and hydrogenation products, cocoa butter replacers and other specialty fats.

The group's edible oil business makes up the largest portion of the group's annual revenue at 72.7%, but comes in third in terms of earnings contribution after oil palm plantations and sugar and cane manufacturing.

d. Grains Trading, Flour and Feed Milling. PPB's grains trading, flour and feed milling activities are held under the now-privatised FFM Bhd (FFM) which commenced operations in 1966 with the establishment of its first flour mill with a daily wheat milling capacity of 150 mt in Port Klang. Today, FFM has grown to be the largest flour miller in Malaysia, with a total wheat milling capacity of 2,430 tonnes per day. At present, FFM produces over 300,000 tonnes of flour a year and supplies more than 40% of Malaysia's wheat flour requirements.

FFM is also one of the biggest feed millers in Malaysia, operating five feed mills in Peninsular and East Malaysia and produces about 300,000 tonnes of animal feeds annually which is about 9% of domestic requirements.

This division (incorporating its livestock farming operations) is the second largest contributor to the group's revenue at 7.1%, while earnings contribution is only at 6.9% of the group's operating earnings for FY04.

e. Livestock Farming. The group's livestock farming business is also held under FFM. Its livestock farming activities include broiler breeding and production of eggs. The business began with the incorporation of Fedfarms Sdn Bhd on 26 June 1984, now known as FFM Farms Sdn Bhd. FFM Farms owns two breeder farms in Sua Betong, Negeri Sembilan and Gurun, Kedah covering a total area of 167ha and operates a layer farm on a 550 acre land in Trong, Taiping which produces 20m eggs a month. It also produces organic fertilizer using pure chicken manure that has been completely composted into a near odourless plant food.

f. Packaging. The packaging business is operated under PGEO and 79.9% subsidiary Tego Sdn Bhd (Tego). PGEO operates a consumer packing plant in Pasir Gudang, Johor for the packing of edible oils into tin cans, PET bottles, HDPE containers (Jerry can) and BIB (bag in box). Most of these packed products are for export whilst some brand names such as "Neptune" and "Seri Murni" are locally distributed. Tego manufactures polybags for sugar, flour and industrial chemical products as well as container bags for bulk cargoes. Tego's factory in Senawang, Negeri Sembilan supplies to the local market while its factory in Yangon, Myanmar caters mainly to the export market.

g. Property Development. The group's property business and investments are operated under PPB Hartabina Sdn Bhd which was acquired between 1982 and 1983, PPB's first foray into the property sector, and its 34% interest in Shaw Brothers Sdn Bhd. PPB Hartabina is developing a 52.6 acres of prime hill land in Taman Segar, Cheras and manages Cheras LeisureMall. It is also carrying out restoration works at Beach street and Church street in Georgetown, Penang.

h. Film Exhibition. PPB's cinema operations are carried out through its 54.2%-owned Golden Screen Cinemas, which operates the largest cinema chain in Malaysia with 95 screens in 17 locations. GSC's new cinema sites will be located at Bandar Utama Phase II and KL Pavilion.

i. Waste Management and Utilities. PPB acquired a 55% stake in Chemquest Sdn Bhd in 1993, a company involved in environmental engineering, waste management and utilities, chemical manufacturing and trading, contract manufacturing, engineering services and information technology. Its environmental engineering, waste management and utilities operations are undertaken by its 99% subsidiary Chemical Waste Management Sdn Bhd (CWM). The Lugouqiao Sewerage Treatment Plant (Phase 1) project, which is a 20-year concession, in Fengtai District, Beijing, was PPB's maiden water engineering project in China. The project could potentially provide PPB with the strategic advantage to bid for 10 other sewerage projects in Beijing, estimated to be worth about RMB2b. To date, CWM has successfully commissioned more than 20 water projects throughout Malaysia and 50 wastewater treatment plants for various types of industries.

3. Earnings outlook

Oil Palm Plantation. PPB Group's main earnings drivers are essentially the oil palm plantation, sugar and cane manufacturing, and edible oils refining division. The largest contributor to the group's earnings is the oil palm plantation operations, undertaken by its 55.6% subsidiary PPB Oil Palms, which is also listed on Bursa Malaysia. Oil palm plantations contributed 36.1% of PPB's operating earnings, followed by the sugar and cane division at 23.3% and edible oils refining at 18.6%.

Being a pure upstream planter, PPB Oil Palms is expected to benefit from firm CPO prices, coupled with high CPO production from young plantation estates. Of its total planted area of 79,111 hectares in 2004, approximately 78% (or 61,777 hectares) is matured, while 17,334 hectares (22%) are immature. With additional plantings, the immature acreage is expected to grow to about 30,000 hectares. We believe PPB Oil Palm's yield profile is very attractive as it ensures rising yields when the immature palms reach maturity over the next couple of years, while young palms attain prime age. The increase in production will also provide the necessary earnings buffer in times of soft CPO prices. Nevertheless, we expect CPO prices to remain firm in 2005 given the persisting tight global edible oil inventories despite the bumper soybean crop from the US and South America.

Sugar Operations. PPB's sugar operations are expected to face margin squeeze due to the increase in raw material prices and higher freight costs. The reason for the expected margin squeeze is due to controlled retail selling price of refined sugar at RM1.45 per kg, while the estimated cost of raw materials ranges between 90 sen to RM1.20 per kg. While sustained high crude oil prices may reduce world income growth which may potentially result in lower sugar consumption, high oil prices will increase demand for ethanol, resulting in a higher proportion of sugar cane being diverted to ethanol production. The squeeze in supplies will effectively drive up prices of raw sugar.

Edible Oils Division. The group's edible oil division is expected to register higher sales in 2005 with the commissioning of the edible oils and fats processing facility in Rotterdam, Netherlands that costs EUR27.7m. To recap, PGEO and KOG Investments entered into a 65:35 JV in KOG Edible Oils BV for a project in Rotterdam. The plant will have processing capacity of 300,000 tonnes of oils and fats per annum and is expected to commence operation in mid-2005. KOG BV has a paid-up capital of EUR12m. PPB's edible oil operations has traditionally been a high volume and low margin business. Operating margins stood at 1.4% based on its FY04 results. As such, earnings will be driven primarily by volume growth. Consumer aversion to genetically modified (GMO) food products in the EU will continue to drive demand for palm oil based oils, which are deemed GMO-free. Palm oil demand from the US market is also expected to pick up with the imposition of trans-fatty acid (TFA) labeling rules which takes effect 1 Jan 2006.

Major Capex. PPB group will be investing approximately RM410m in capital expenditure this year. A significant portion of the capex (approximately RM244m) will be for PPB Oil Palm's construction of mills including property, plant and equipment, and plantation development. FFM will be spending about RM129m for the mill construction in Pulau Indah (RM23m), an oil refinery in Bintulu and Lahad Datu (RM60m), a new flour mill at West Port (RM25m) and a shortening plant at Pasir Gudang (RM21m). The leisure business will spend approximately RM17.6m in new cinema sites at Bandar Utama Phase 2. The property, waste management and other division will spend about RM20m in capex for 2005.

Financials. PPB registered a 18% growth in turnover for FY04 (RM11.0b vs RM9.3b in 2003) while operating earnings improved 8.5% to RM602m. The increase in turnover was largely due to higher palm oil products realised, improved crop production and higher sales volume registered in the group's edible oils division. In summary, the oil palm plantation, edible oil refining and shipping division registered higher earnings, while contributions from sugar refining, grains trading and flour and feed milling operations were lower due to increase in raw materials cost and higher freight charges.

The group registered 5-year turnover CAGR of 20.4% and EBIT 5-year CAGR of 12.9%. EBIT margins over the last 5 years have been maintained between 4.2% and 6.8%, while net margins ranged between 3.0% and 4.7%.

4. Investment Risk

Rising raw materials costs and high freight costs will have a negative impact on the group's profitability, since margins are already in the low single-digits.

Stock liquidity has generally been poor due to the low free float, but is expected to improve with the upcoming bonus issue. Kuok group holds about 42.4% of PPB Group, while approximately 20% of the shareholding is held by institutions. The group has proposed a bonus issue of 592.7m shares on the basis 1 bonus share for every 1 existing share held.

5. Recent Developments

Acquisition of Kerry-Glory Flour Mills

PPB acquired a 43.35% equity interest in Kerry-Glory Flour Mills Co Ltd for Baht329.45m (about RM30.7m). Kerry-Glory is principally involved in wheat flour milling and distribution and owns a 250MT per day wheat mill. The acquisition is expected to enhance the group's operational efficiency in the wheat flour milling business.

PPB Oil Palms increases its Indonesian plantation landbank

PPB Oil Palms increased its landbank by 67,189 hectares to 210,788 hectares following the acquisition of four Indonesian plantation companies, which include PT Sarana Titan Permata, PT Karunia Kencana Permaisejati, PT Bumi Sawit Kencana and PT Mentaya Sawit Mas. The acquisition is in line with the group's aspiration to own a total of 100,000 hectares of plantation land in Central Kalimantan in five years time.

Property: Launched Segar Court project in July 2004

PPB Hartabina launched the Segar Court project in July last year. The project entails a low density development and is expected to generate sales of RM17m.

Cinemas: GSC Gurney Plaza and Berjaya Times Square

The new GSC, Gurney Plaza, which is a 12-screen multiplex, was successfully opened in January 2004. The 9-screen multiplex at Berjaya Times Square was successfully launched in January 2005. GSC has also secured new cinema sites at Bandar Utama Phase II, which comprises 13-screens targeted to open mid-2005, and KL Pavillion (13-screens) targeted to open mid-2007.

5. Valuations and Recommendation

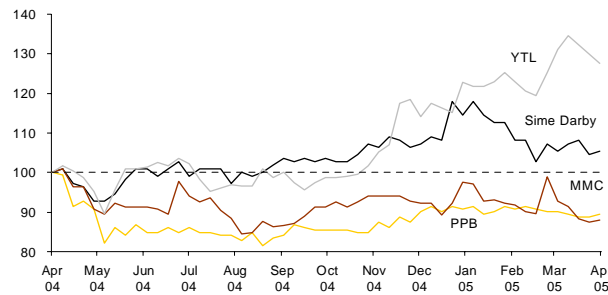
Fair value RM8.00. As the group's earnings base is quite diversified, we are using the RNAV based valuation method (Appendix: Table 2) and have arrived at a fair value of RM8.00 for the shares (RM4.00 ex-Bonus Issue), which implies a PER05 of 12.1x and a P/BV of 1.2x. Our fair value translates to a 18.5% upside from the current market price of RM6.76. Hence, we initiate coverage on PPB Group with a **BUY** recommendation.

Given the diversity of business of the other peer conglomerates, we do not believe the valuation based on direct peer comparison is meaningful. Nevertheless, we have included the profile of several listed conglomerate below.

Attractive dividend yield. The group also maintains a good dividend track record and has gradually increased dividend payout over the years. Its latest gross dividend of 30 sen per share for FY04 translates to a 4.4% yield. We do not doubt the group's ability to continue paying out attractive dividends given the strong operating cashflow of between RM400m to RM500m annually.

Comparative Valuation				
	PPB	Sime Darby	MMC	YTL
Share Price (RM) 15 Apr 2005	6.75	5.85	2.00	5.50
Mkt Cap (RM m)	4,001.1	13,972.4	2,253.2	8,345.8
Avg Daily Vol (m)	0.3	1.9	0.3	1.4
PER FY03 (x)	8.7	14.6	16.6	13.0
PER FY04 (x)	9.0	14.0	7.9	9.1
P/NTA	1.0	1.8	0.7	1.4
Yield (%)	4.4	4.4	2.5	1.4

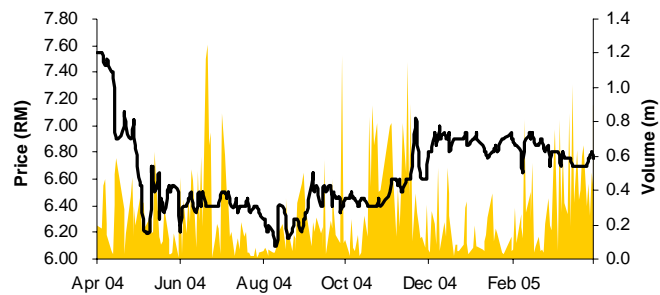
Relative Price Chart of PPB, Sime Darby, MMC and YTL



Balance Sheet and Other Financial Data (RM m)

FYE 31 December	2004A	2005E	2006F	2007F
Total Assets	6,133.9	6,359.1	6,586.1	6,820.7
Fixed Assets	2,642.3	2,829.6	2,843.7	2,852.1
Current Assets	2,347.1	2,384.9	2,597.8	2,824.1
LT Assets	1,144.6	1,144.6	1,144.6	1,144.6
Current Liabilities	932.6	975.5	1,000.3	1,019.2
LT Liabilities	149.8	149.8	149.8	149.8
Share Capital	592.7	1,185.5	1,185.5	1,185.5
Shareholder Funds	3,960.1	4,071.5	4,189.0	4,309.6

Price Chart of PPB Group



PROFIT AND LOSS STATEMENT

	FY04E	FY05F	FY06F	FY07F	FY08F
FYE Dec (RM m)					
Turnover	10,999.7	12,449.9	13,811.1	15,073.5	16,420.2
Cost of sales	(9,925.0)	(11,257.8)	(12,499.1)	(13,641.5)	(14,860.3)
Gross profit	1,074.7	1,192.1	1,312.1	1,432.0	1,559.9
Distribution cost	(241.7)	(273.6)	(303.8)	(331.6)	(361.2)
Administrative expenses	(159.1)	(180.1)	(165.7)	(180.9)	(197.0)
Interest income	13.4	8.8	6.3	4.9	5.6
Others	71.9	79.4	(6.7)	(72.1)	(141.7)
EBITDA	759.3	826.6	842.1	852.2	865.5
Depreciation	(145.9)	(165.3)	(171.0)	(176.6)	(182.2)
EBIT	613.3	661.3	671.1	675.6	683.2
Interest expense	(15.1)	(13.7)	(12.8)	(11.6)	(10.4)
EBT (before EI)	598.2	647.5	658.4	664.0	672.9
Associates	65.5	50.0	50.0	50.0	50.0
Pretax profit	733.5	697.5	708.4	714.0	722.9
Taxation	(183.8)	(174.4)	(177.1)	(178.5)	(180.7)
Profit before MI	549.7	523.1	531.3	535.5	542.2
Minority interest	(149.1)	(130.8)	(132.8)	(133.9)	(135.5)
PATMI	400.7	392.4	398.5	401.6	406.6
Diluted share capital (m) *	1,185.5	1,185.5	1,185.5	1,185.5	1,185.5
Diluted EPS (sen)	33.8	33.1	33.6	33.9	34.3

* Based on diluted share capital ex-Bonus Issue

MARGINS AND RATIOS

	FY04E	FY05F	FY06F	FY07F	FY08F
Growth (%)					
Turnover	18.0%	13.2%	10.9%	9.1%	8.9%
EBITDA	0.0	0.1	0.0	0.0	0.0
EBIT	0.0	0.1	0.0	0.0	0.0
Operating profit	2.7%	8.2%	1.7%	0.9%	1.3%
Pretax profit	3.7%	-4.9%	1.6%	0.8%	1.2%
Net profit	7.9%	-2.1%	1.6%	0.8%	1.2%
Turnover 5-yr CAGR	20.4%				10.5%
EBIT 5-yr CAGR	12.9%				2.7%
Profitability (%)					
Gross margin	9.8%	9.6%	9.5%	9.5%	9.5%
EBITDA margin	6.9%	6.6%	6.1%	5.7%	5.3%
Operating margin	5.4%	5.2%	4.8%	4.4%	4.1%
Pretax margin	6.7%	5.6%	5.1%	4.7%	4.4%
Net margin	3.6%	3.2%	2.9%	2.7%	2.5%
Effective tax rate	25.1%	25.0%	25.0%	25.0%	25.0%
Ratios					
ROE (%)	10.1%	9.6%	9.5%	9.3%	9.2%
ROA (%)	6.5%	6.2%	6.0%	5.9%	5.7%
Gross gearing (x)	0.04	0.04	0.04	0.04	0.04
Net cash/(debt) to equity (x)	Net cash	Net cash	Net cash	0.01	0.00
Sales per share (RM)	9.28	10.50	11.65	12.71	13.85
EBITDA per share (RM)	0.64	0.70	0.71	0.72	0.73
Cash per share (RM)	0.45	0.29	0.20	0.15	0.17
Gross interest cover (x)	39.74	47.50	52.14	57.65	65.32
Price to Book (x)	0.51	0.98	0.96	0.93	0.90
Price to NTA (x)	0.51	0.99	0.96	0.94	0.91
Price to OCF (x)	9.03	7.90	9.24	8.49	7.38
Price to Sales (x)	0.36	0.32	0.29	0.27	0.24
Price to EBITDA (x)	5.27	4.84	4.75	4.69	4.62
EV/EBITDA (x)	5.81	5.73	5.91	6.06	6.10
Book value per share (RM)	6.68	3.43	3.53	3.64	3.74

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SELL	Price depreciation in excess of 10% expected in the next 12 months
TRADINGBUY/SELL	Significant price movement expected in the next 3 months arising from positive/negative newsflow. For example, mergers and acquisition, corporate restructuring, and potential of obtaining new projects.
AVOID	Uncertainty in newsflow.

Applicability of Ratings:

The respective analyst maintains a coverage universe of stocks, the list of which may be adjusted according to needs. Investment ratings are only applicable to the stocks which form part of the coverage universe. Reports on companies which are not part of the coverage do not carry investment ratings as we do not actively follow developments in these companies.

Some common terms abbreviated in this report (where they appear):

P = price	PBT/PAT = Profit before tax/Profit after tax	mom = month-on-month
PE/PER = price earnings/ PE ratio	NTA = net tangible asset	yoy = year-on-year
PEG = PE ratio to growth	NAV = net asset value	qoq = quarter-on-quarter
FV = fair value	EBIT = Earnings before interest, tax	ytd = year-to-date
BV = book value	EBITDA = EBIT, depreciation and amortisation	FY/FYE = financial year/ financial year end
EV = enterprise value	CY = calendar year	DCF = discounted cashflow
ROE = return on equity	capex = capital expenditure	FCF = free cashflow
ROA = return on asset	adex = advertising expenditure	CAGR = compounded annual
ROS = return on shareholders' funds	p.a = per annum growth rate	EPS = earnings per share
WACC = weighted average cost of capital	DPS = dividend per share	

A.4 Example of cumulative abnormal return (CAR) of participating companies

Figure A.1: CAR- AKNMTEC

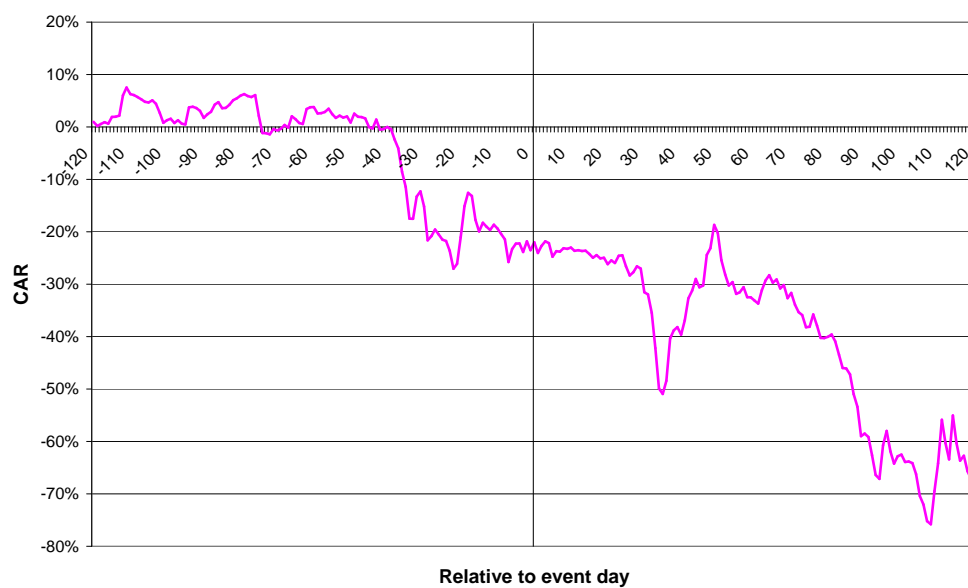


Figure A.2: CAR- ATIS

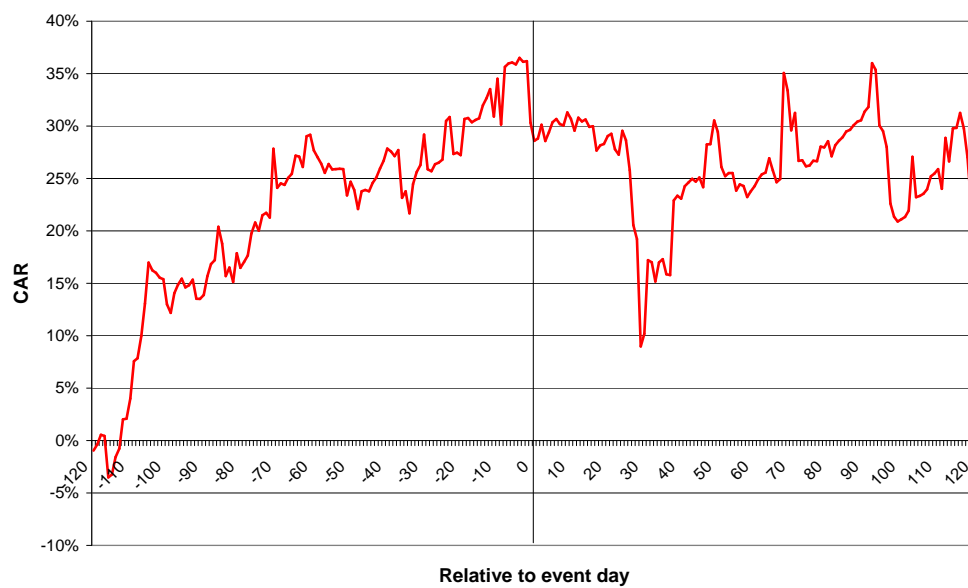


Figure A.3: CAR- BSA

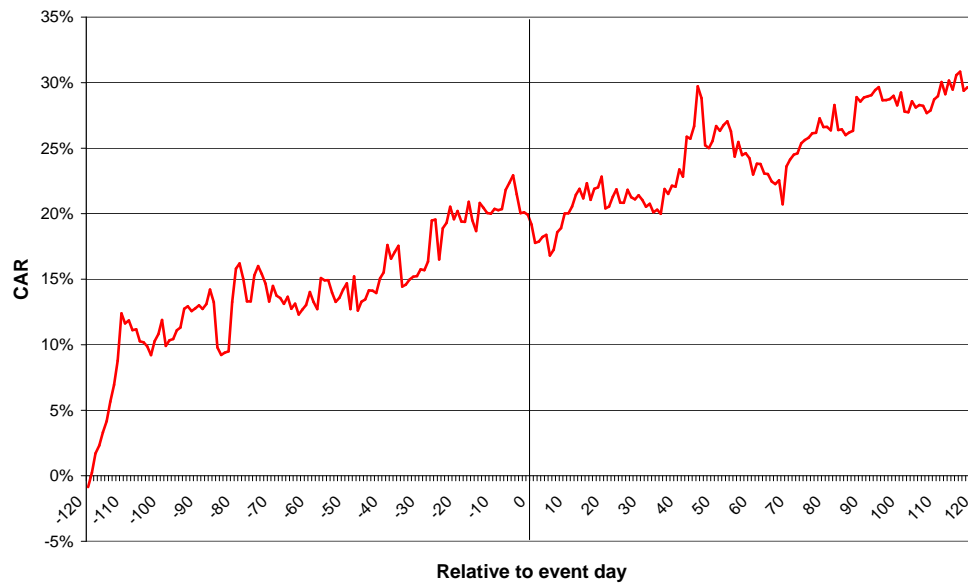


Figure A.4: CAR- CBIP

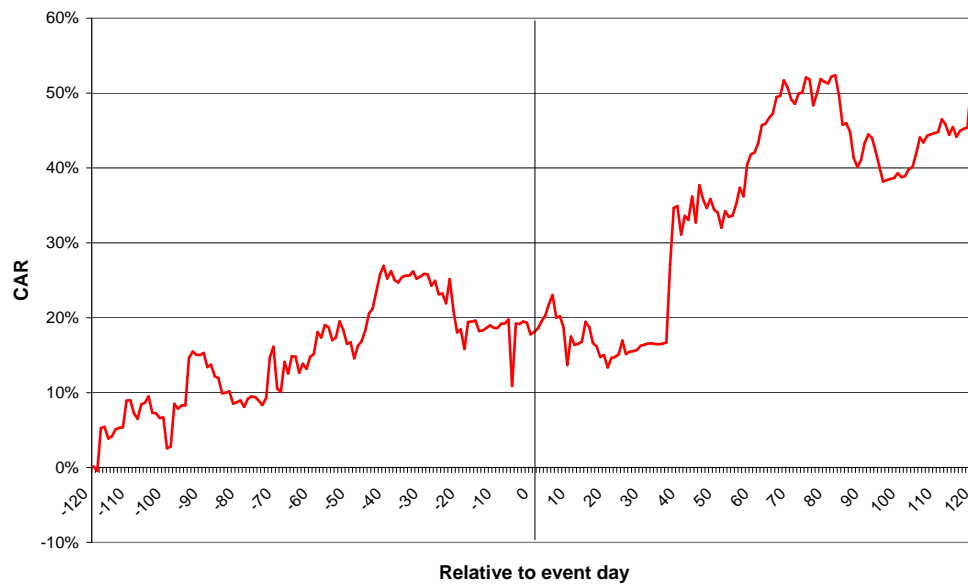


Figure A.5: CAR- HIAPTEK

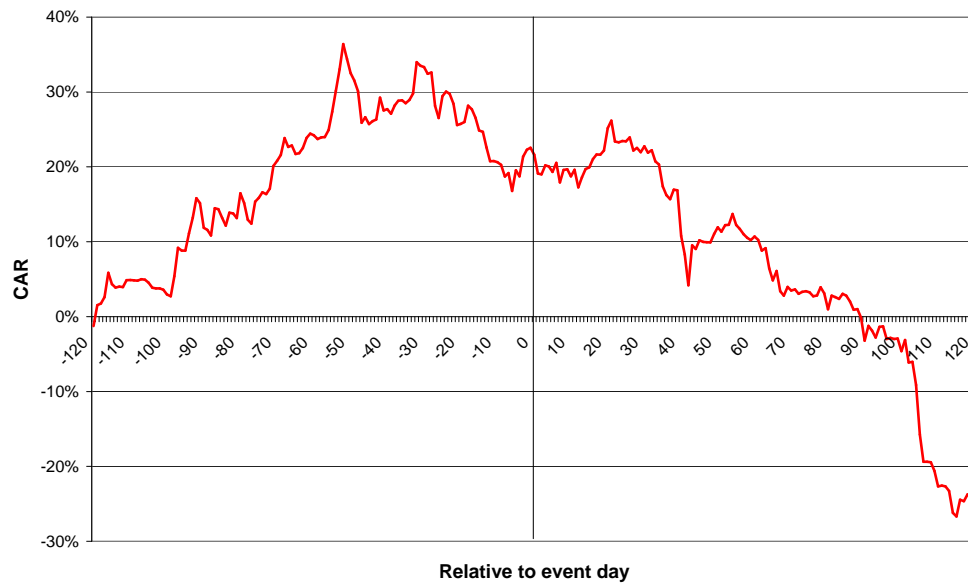
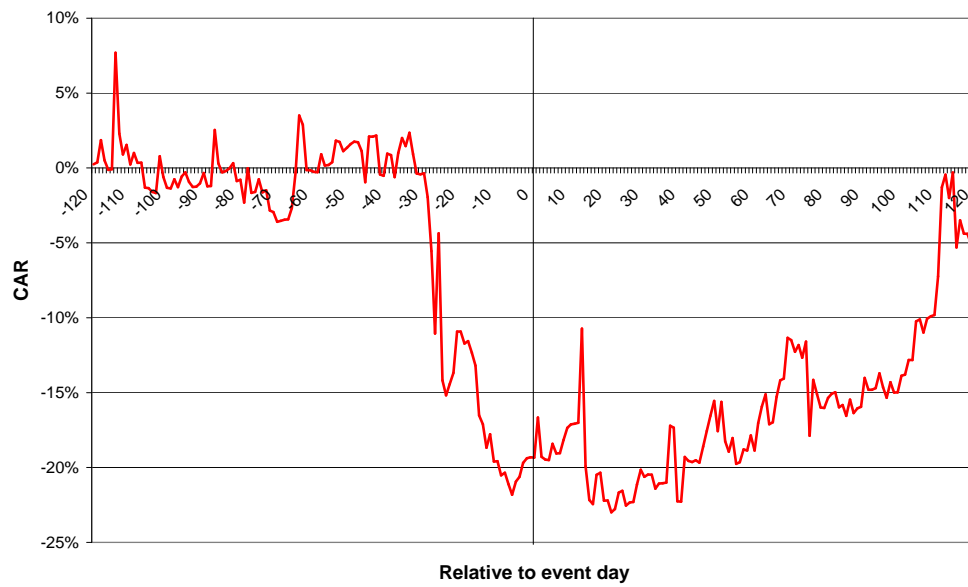


Figure A.6: CAR- KMLOONG



A.5 Sample of SPSS statistical tests output

A.5.1 *t*-test mean comparison

T-Test

Group Statistics					
	l=smp_2=ctl	N	Mean	Std. Deviation	Std. Error Mean
C2UNSTD	1	55	.0004984	.00190470	.00025683
	2	50	.0006670	.00128526	.00018176
C2UN_BF	1	55	.0006780	.00221768	.00029903
	2	50	.0006507	.00121734	.00017216
C2UN_AF	1	55	.0017053	.00521235	.00070283
	2	50	.0007037	.00143712	.00020324

Independent Samples Test

Levene's Test for Equality of Variances					t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
C2UNSTD	Equal variances assumed	.610	.436	-.526	103	.600	-.0001686	.00032035	-.00080398 .00046671
	Equal variances not assumed			-.536	95.294	.593	-.0001686	.00031464	-.00079325 .00045598
C2UN_BF	Equal variances assumed	2.619	.109	.077	103	.939	.0000273	.00035407	-.00067490 .00072953
	Equal variances not assumed			.079	85.391	.937	.0000273	.00034505	-.00065869 .00071332
C2UN_AF	Equal variances assumed	5.705	.019	1.314	103	.192	.0010016	.00076247	-.00051057 .00251380
	Equal variances not assumed			1.369	62.924	.176	.0010016	.00073163	-.00046047 .00246369

T-Test - sample

A.5.2 Multiple mean comparison procedures

Multiple Comparisons

Dependent Variable: illiquidity measure

	(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidenc e Interval	
						Lower Bound	Upper Bound
LSD	1 1=bb,2=bh ,3=eb,4=e h,5=ab,6=ah	2	-1.12988	.933605	.228	-2.97375	.71399
		3	.28647	.907786	.753	-1.50640	2.07935
		4	1.00080	.933605	.285	-.84307	2.84467
		5	.34686	.907786	.703	-1.44601	2.13974
		6	-1.02221	.933605	.275	-2.86608	.82166
	2	1	1.12988	.933605	.228	-.71399	2.97375
		3	1.41636	.933605	.131	-.42751	3.26022
		4	2.13068 *	.958729	.028	.23720	4.02417
		5	1.47674	.933605	.116	-.36712	3.32061
		6	.10767	.958729	.911	-1.78581	2.00116
	3	1	-.28647	.907786	.753	-2.07935	1.50640
		2	-1.41636	.933605	.131	-3.26022	.42751
		4	.71433	.933605	.445	-1.12954	2.55819
		5	.06039	.907786	.947	-1.73249	1.85326
		6	-1.30868	.933605	.163	-3.15255	.53518
	4	1	-1.00080	.933605	.285	-2.84467	.84307
		2	-2.13068 *	.958729	.028	-4.02417	-.23720
		3	-.71433	.933605	.445	-2.55819	1.12954
		5	-.65394	.933605	.485	-2.49780	1.18993
		6	-2.02301 *	.958729	.036	-3.91650	-.12952
	5	1	-.34686	.907786	.703	-2.13974	1.44601
		2	-1.47674	.933605	.116	-3.32061	.36712
		3	-.06039	.907786	.947	-1.85326	1.73249
		4	.65394	.933605	.485	-1.18993	2.49780
		6	-1.36907	.933605	.145	-3.21294	.47479
	6	1	1.02221	.933605	.275	-.82166	2.86608
		2	-.10767	.958729	.911	-2.00116	1.78581
		3	1.30868	.933605	.163	-.53518	3.15255
		4	2.02301 *	.958729	.036	.12952	3.91650
		5	1.36907	.933605	.145	-.47479	3.21294

* The mean difference is significant at the .05 level.

A.6 Market model: test statistics of abnormal return

Table A.1: The t -test statistics, standardised t -test and rank statistics of CAR of participating companies

Day	AR	CAR	t -test	std. t -test	rank test
-30	-0.34%	-0.341%	-1.399	-1.561	-1.312
-25	-0.17%	-1.167%	-1.953*	-2.554**	-2.475**
-20	0.24%	-1.097%	-1.355	-1.676*	-1.604
-15	-0.42%	-1.586%	-1.625	-2.123**	-2.009**
-10	0.10%	-1.251%	-1.119	-1.598	-1.146
-9	-0.42%	-1.666%	-1.456	-1.880*	-1.558
-8	-0.68%	-2.348%	-2.006**	-2.495**	-1.872*
-7	-0.35%	-2.699%	-2.258**	-2.878***	-2.056**
-6	-0.38%	-3.075%	-2.520**	-3.126***	-2.010**
-5	0.06%	-3.014%	-2.422**	-3.040***	-1.789*
-4	0.17%	-2.839%	-2.239**	-2.799***	-1.543
-3	-0.16%	-3.003%	-2.326**	-2.861***	-1.895*
-2	0.32%	-2.681%	-2.040**	-2.641***	-1.745*
-1	-0.52%	-3.201%	-2.395**	-2.954***	-1.958*
0	-0.09%	-3.293%	-2.424**	-2.982***	-2.003**
1	-0.20%	-3.491%	-2.530**	-3.109***	-2.061**
2	0.02%	-3.475%	-2.479**	-2.949***	-1.953*
3	-0.02%	-3.493%	-2.455**	-2.947***	-1.997**
4	0.19%	-3.300%	-2.286**	-2.746***	-1.769*
5	0.13%	-3.174%	-2.168**	-2.575**	-1.634
6	-0.33%	-3.507%	-2.363**	-2.798***	-1.757*
7	-0.01%	-3.517%	-2.338**	-2.737***	-1.702*
8	-0.22%	-3.735%	-2.451**	-2.899***	-1.790*
9	-0.24%	-3.977%	-2.577**	-2.983***	-1.755*
10	-0.07%	-4.046%	-2.590**	-3.004***	-1.789*
15	-0.21%	-4.629%	-2.797***	-3.183***	-2.256**
20	-0.09%	-5.524%	-3.170***	-3.509***	-2.285**
25	-0.39%	-6.426%	-3.519***	-3.951***	-2.261**
30	-0.16%	-7.557%	-3.966***	-4.508***	-2.527**

*** significant at 1%, ** significant at 5%, * significant at 10% level

A.7 Market-adjusted model: test statistics of abnormal return

Table A.2: The t -test statistics, standardised t -test and rank statistics of CAR of participating companies

Day	AR	CAR	t -test	std. t -test	rank test
-30	-0.394%	-0.394%	-1.536	-1.733*	-1.095
-25	-0.257%	-1.521%	-2.424**	-3.040***	-1.626
-20	0.289%	-1.680%	-1.977*	-2.271**	-0.726
-15	-0.534%	-2.172%	-2.120**	-2.527**	-0.558
-10	0.033%	-1.823%	-1.553	-1.899*	0.597
-9	-0.407%	-2.229%	-1.855*	-2.185**	0.255
-8	-0.625%	-2.854%	-2.323**	-2.666**	0.098
-7	-0.276%	-3.130%	-2.494**	-2.950***	0.062
-6	-0.432%	-3.562%	-2.781***	-3.224***	0.075
-5	0.061%	-3.501%	-2.680**	-3.170***	0.268
-4	0.120%	-3.381%	-2.540**	-2.964***	0.500
-3	-0.238%	-3.619%	-2.670**	-3.116***	0.167
-2	0.187%	-3.432%	-2.487**	-2.980***	0.194
-1	-0.559%	-3.991%	-2.844***	-3.321***	0.012
0	-0.178%	-4.169%	-2.923***	-3.404***	-0.031
1	-0.290%	-4.458%	-3.076***	-3.594***	-0.119
2	-0.094%	-4.552%	-3.093***	-3.524***	-0.062
3	-0.164%	-4.716%	-3.157***	-3.642***	-0.252
4	0.075%	-4.641%	-3.062***	-3.510***	-0.118
5	0.019%	-4.622%	-3.007***	-3.428***	-0.135
6	-0.398%	-5.020%	-3.221***	-3.673***	-0.218
7	-0.049%	-5.069%	-3.210***	-3.641***	-0.123
8	-0.349%	-5.418%	-3.387***	-3.874***	-0.236
9	-0.476%	-5.895%	-3.638***	-4.133***	-0.398
10	-0.323%	-6.217%	-3.790***	-4.333***	-0.582
15	-0.399%	-7.647%	-4.401***	-5.017***	-1.329
20	-0.095%	-8.719%	-4.766***	-5.318***	-1.204
25	-0.369%	-9.520%	-4.966***	-5.618***	-0.812
30	0.019%	-10.500%	-5.248***	-5.931***	-0.865

*** significant at 1%, ** significant at 5%, * significant at 10% level

A.8 Market-adjusted model of abnormal return

Table A.3: Abnormal returns: participating vs. control

Day	AR (P)(%)	AR (C)(%)	CAR (P)(%)	CAR (C)(%)	CAR Diff. (%)
-30	-0.394	0.256	-0.394***	0.256	-0.650**
-20	0.289	0.211	-1.680***	-0.705	-0.975
-10	0.033	0.002	-1.823	-0.913	-0.910
-9	-0.407	-0.446**	-2.229**	-1.359	-0.871
-8	-0.625**	-0.414*	-2.854**	-1.773*	-1.081
-7	-0.276	-0.076	-3.130***	-1.850*	-1.281
-6	-0.432*	0.218	-3.562***	-1.632	-1.931
-5	0.061	-0.342	-3.501***	-1.974*	-1.528
-4	0.120	-0.125	-3.381***	-2.098*	-1.282
-3	-0.238	-0.234	-3.619***	-2.333**	-1.286
-2	0.187	-0.188	-3.432***	-2.521**	-0.911
-1	-0.559**	-0.291	-3.991***	-2.812**	-1.179
0	-0.178	-0.298	-4.169***	-3.110**	-1.058
1	-0.290	-0.111	-4.458***	-3.221**	-1.237
2	-0.094	0.045	-4.552***	-3.177**	-1.376
3	-0.164	-0.209	-4.716***	-3.385**	-1.331
4	0.075	-0.368	-4.641***	-3.753***	-0.888
5	0.019	-0.050	-4.622***	-3.803***	-0.819
6	-0.398	-0.033	-5.020***	-3.836***	-1.184
7	-0.049	-0.407*	-5.069***	-4.243***	-0.826
8	-0.349*	-0.158	-5.418***	-4.401***	-1.017
9	-0.476	-0.059	-5.895***	-4.460***	-1.434
10	-0.323	-0.246	-6.217***	-4.706***	-1.511
20	-0.095	-0.410*	-8.719***	-7.990***	-0.730
30	0.019	-1.096***	-10.500***	-10.956***	0.457

notes: (P) - participating, (C) - control,

*** significant at 1%, ** significant at 5%, * significant at 10% level

A.9 Market model of abnormal return

Table A.4: Abnormal returns: the buy vs. hold recommendations

Day	Buy AR (%)	Hold AR (%)	Buy CAR (%)	Hold CAR (%)	CAR Diff. (%)
-30	-0.300	-0.387	-0.300	-0.387	-0.075
-25	-0.470	0.160	-1.545**	-0.746	-1.397
-20	0.424	0.035	-1.698*	-0.426	-1.424
-15	-0.403	-0.433	-2.161*	-0.945	-1.257
-10	0.320	-0.145	-1.600	-0.861	-0.726
-9	-0.496*	-0.326	-2.096	-1.187	-0.899
-8	-0.299	-1.108***	-2.395*	-2.294	-0.526
-7	0.027	-0.774*	-2.369	-3.068	-0.111
-6	-0.363	-0.390	-2.731*	-3.458*	-0.165
-5	0.280	-0.184	-2.451	-3.641*	0.113
-4	0.184	0.165	-2.267	-3.476	0.153
-3	-0.241	-0.079	-2.509	-3.555	0.033
-2	0.231	0.424	-2.277	-3.132	-0.015
-1	-0.289	-0.777*	-2.567	-3.908*	0.153
0	0.112	-0.320	-2.454	-4.229*	0.359
1	-0.334	-0.047	-2.788*	-4.276*	0.174
2	0.362	-0.369	-2.426	-4.645**	0.542
3	-0.221	0.208	-2.647	-4.437*	0.319
4	0.137	0.256	-2.510	-4.181*	0.287
5	-0.307	0.610	-2.817	-3.572	-0.139
6	-0.247	-0.429	-3.064*	-4.000	-0.103
7	0.186	-0.230	-2.878	-4.230*	0.092
8	-0.013	-0.448	-2.890	-4.678*	0.259
9	-0.398	-0.068	-3.288*	-4.746*	0.069
10	0.286	-0.465	-3.002	-5.210**	0.397
15	-0.118	-0.321	-3.301*	-6.110**	0.549
20	0.270	-0.501	-3.731*	-7.525**	0.802
25	-0.501*	-0.274	-4.147*	-8.969***	1.048
30	-0.912***	0.677*	-6.086**	-9.198***	0.233

*** significant at 1%, ** significant at 5%, * significant at 10% level

A.10 Rank test of illiquidity measure

Table A.5: Rank test of illiquidity measure λ_a - participating vs. control

Day	λ_a (P)	λ_a (C)	Rank test (P)	Rank test (C)
-30	7.84	0.12	0.669	-0.056
-25	5.08	0.22	0.748	0.823
-20	4.30	0.24	0.983	0.465
-15	0.58	0.75	1.186	0.995
-10	19.79	0.53	1.334	0.734
-9	1.16	0.61	1.146	1.073
-8	2.38	0.25	1.490	1.095
-7	0.92	0.33	1.473	1.020
-6	2.54	0.91	0.866	0.227
-5	3.91	0.67	1.182	0.347
-4	1.65	1.07	0.619	0.762
-3	0.94	1.05	0.951	0.701
-2	0.80	3.40	0.835	1.092
-1	2.76	0.62	0.904	1.109
0	1.23	0.37	0.588	0.031
1	1.66	0.61	0.890	1.216
2	1.16	0.85	0.935	1.055
3	1.09	0.61	1.072	0.138
4	2.43	0.13	1.035	-0.052
5	2.39	0.07	1.403	-0.315
6	0.57	0.71	0.993	0.649
7	0.64	0.80	0.753	0.815
8	0.73	1.85	1.311	0.636
9	2.00	0.53	1.072	0.573
10	1.53	0.50	0.313	1.190
15	1.74	1.06	1.426	1.125
20	7.56	0.57	1.703*	0.911
25	7.08	0.82	0.712	2.034**
30	0.92	0.50	1.565	1.689*

*** significant at 1%, ** significant at 5%, * significant at 10% level
(P)- participating companies, (C)- control

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